Barnstable AIRPORT HYANNIS

Response to August 4, 2016 Request for Information

Barnstable Municipal Airport
Hyannis, Massachusetts

September 2016

Prepared for:
Massachusetts Department of Environmental Protection
Southeast Regional Office
20 Riverside Drive
Lakeville, MA 02347

Prepared by:
Barnstable Municipal Airport
480 Barnstable Road
Hyannis, MA 02840

Barnstable Municipal Airport
August 4, 2016 Request for Information Response

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BARNSTABLE MUNICIPAL AIRPORT
BOARDMAN-POLANDO FIELD
480 BARNSTABLE ROAD, 2ND FLOOR
HYANNIS, MA 02601
www.town.barnstable.ma.us

Office: 508-775-2020
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R.W. "Bud" Breault, Jr., Airport Manager
Katie R. Servis, Assistant Airport Manager

Barnstable Municipal Airport Commission:

John T. Griffin, Jr., Chairman

Timothy R. Luzietti, Vice Chairman

Robert L. O'Brien, Clerk

Mary F. Smith, Commissioner

Stephen P. Cobb, Commissioner

Elizabeth Young, Commissioner

James DellaMorte, Commissioner

September 14, 2016

Gerard M.R. Martin
Deputy Regional Director
Bureau of Waste Site Cleanup
Massachusetts Department of Environmental Protection
Southeast Regional Office
20 Riverside Drive
Lakeville, MA 02347

Re: Request for Information/Interim Deadline dated August 4, 2016

Dear Mr. Martin,

The following is in response to the Request for Information (RFI) pursuant to M.G.L. c 21E and 31 CMR 40.0000 et seq. dated August 4, 2016 sent to the Barnstable Municipal Airport. The response on the following pages follows the response protocol as outlined in Attachment B of the August 4, 2016 RFI.

Please let me know if you have any questions regarding the information provided.

Sincerely,

R.W. "Bud" Breault, Jr.
Airport Manager
Barnstable Municipal Airport

CC: Katie R. Servis, Assistant Airport Manager
Mark Ells, Town Manager, Barnstable
Ruth Weil, Town Attorney, Barnstable
Anderson & Kreiger, LLP

Attachment A – Request for Information Item	Barnstable Municipal Airport Response
1. Please state the full legal name of the respondent. 2. Please state the nature of the respondent's relationship to the Barnstable Municipal Airport	• R.W. "Bud" Breault, Jr. – Airport Manager • Katie R. Servis - Assistant Airport Manager
3. Identify if the respondent oversees emergency preparedness at Barnstable Municipal Airport, including management of Aqueous Film Forming Foams (AFFFs) on the property.	• Both Mr. Breault, and Ms. Servis oversee the Airport's Aircraft Rescue and Fire Fighting (ARFF) Coordinator, Michael Kondracki, who manages AFFFs on the property on behalf of the airport and as part of the Federal Aviation Administration's (FAAs) Federal Aviation Regulation (FAR) Part 139 certification.
4. If the Respondent does not oversee emergency preparedness at Barnstable Municipal Airport, please indicate the organization that does.	• N/A. See response to request #3 above.
5. Does the Respondent have or ever had Part 139 Certification from the FAA?	• Yes, the respondent holds a FAR Part 139 Certificate requiring the use of AFFF.
6. Identify past uses of AFFF including fire suppression, prevention, training and demonstrations including those required for FAA certifications.	• See Exhibit A, attached.
7. Identify the current and past amounts of stockpiles, purchases, and donations of AFFFs. Include the brand name and any Material Safety Data Sheets (MSDS) associated with any AFFFs.	• See Exhibit A, attached. • See Exhibit B, attached. o Note that two formulations of the same AFFF product are presented. The new AFFF has been on-site since May 1, 2016.
8. Identify any areas and dates at Barnstable Municipal Airport where AFFFs have been historically used.	• See Exhibit A, attached. • See Figure 2 of Exhibit C, attached.
9. Are there structures at Barnstable Municipal Airport used to contain AFFF when it is used?	• See Exhibit A, attached. • See Figure 1 of Exhibit C, attached AFFF is either stored in the three fire vehicles owned by the airport and parked in ARFF/Snow Removal Equipment (SRE) building or stockpiled in that building.
10. Identify the location of any on site groundwater supply wells at Barnstable Municipal Airport.	• See Exhibit C, attached.
11. Have you ever sampled groundwater at the Barnstable Municipal Airport for perfluoroalkyl substances? If so, include the results of that sampling. And, if so, provide the analytical data and well construction details (if groundwater was sampled).	• See Exhibit D, attached.

The following are attached:

- Exhibit A:
  - August 19, 2016 Memorandum from Katie Servis, Assistant Airport Manager to the airport's consultant, Horsley Witten Group, Inc. ("HW"), regarding data collection for the RFI.
- Exhibit B:
  - Safety Data Sheets for AFFF.
- Exhibit C:
  - September 7, 2016 Memorandum from HW to Airport Management regarding data collection for the RFI.
- Exhibit D:
  - Groundwater sampling results summary table, laboratory analytical reports, and boring logs.

Certification of Submittal:

"I certify under the penalties of law that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying the certification, and that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material information contained herein is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties, including but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information."

R.W. "Bud" Breault, Jr.
Airport Manager
Barnstable Municipal Airport

Date: 09/14/2016

EXHIBIT A

BARNSTABLE MUNICIPAL AIRPORT
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HYANNIS, MA 02601
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R.W. "Bud" Breault, Jr., Airport Manager
Katie R. Servis, Assistant Airport Manager

Memo

To: Joe Longo

From: Katie Servis, Assistant Airport Manager

cc: Roland "Bud" Breault, Airport Manager

Date: 8/19/16

Re: Data Collection for Request for Information (RFI) from Department of Environmental Protection (DEP)

The following data has been collected for the Department of Environmental Protection (DEP) Request for Information (RFI) dated August 4, 2016.

Notes:

- Annual testing per Federal Aviation Administration (FAA) regulations is required to ensure that we have the appropriate Aqueous Film Forming Foam (AFFF)-to-water concentration.
  - Annually, 80 gallons of AFFF concentrate is used to conduct FAA required testing.
  - FAA required testing has been conducted in the AFFF Deployment Location for the past 17 or more years.
  - The AFFF deployment area is upaved and does not discharge stormwater to the Airport's stormwater drainage system. It does not have a containment structure.

- All firefighters must attend annual training , which occurs off-site at FAA approved training facilities at Boston Logan Airport or Concord, New Hampshire.
  - In 2015, additional training for our staff was conducted at the Airport. Mechanical issues with the fire trucks required the use of AFFF to confirm proper operation. The additional training occurred on May 27 and 28, 2016.
  - Approximately 80 gallons of AFFF concentrate was used.

- Tri-Annual Drill Dates:
  - With the exception of July 17, 1991, all tri-annual drills occur on the East Ramp in the AFFF Deployment Location

- July 17, 1991 (location of drill in safety area near current Taxiway A1)
- Nov. 16, 1994
- Nov. 17, 1997
- Nov. 2, 2000
- Oct. 18, 2003
- Oct. 25, 2006
- Oct. 22, 2009
- Oct. 11, 2012
- Oct. 28, 2015 (No AFFF concentrate used during this drill – only water was used)

- We are required per FAA regulations to have enough stockpiled AFFF concentrate to resupply two trucks. This is approximately 405 gallons. Current stockpiled supply is as follows:
  - 265 Gallons - 3% Chemguard C301 MS – 265-gallon tote
  - 105 Gallons - 3% Chemguard C301 MS – 21 five-gallon pails
  - 50 Gallons - 3% Chemguard C306-MS-C – 10 five-gallon pails

- We have 185 gallons of AFFF concentrate that will be removed by Global Remediation and is no longer usable for our operations because it has passed its expiration date.
  - 3% Chemguard C301 MS - three five gallon pails of expired AFFF concentrate
  - 3% Ansulite AFFF - one five gallon pail of expired AFFF concentrate
  - 3% Chemguard C301 MS - three 55-gallon drums of expired AFFF concentrate

- To the best of our knowledge, no AFFF concentrate has been donated to another entity.

- Personnel working at the Airport since 1980 were consulted to determine when AFFF use occurred during an actual aircraft accident and only two instances were identified.
  - 1981 crash of a Beech 18 aircraft east of runway 24 between Willow Street and the Airport
  - 2016 crash of a Cirrus aircraft in the parking lot of the rental car facility west of the terminal building. Approximately 10 gallons of AFFF concentrate was used during the crash response.

The following table highlights the quantities purchased and the approximate volume of AFFF concentrate used for training, drills, and FAA required testing, and the quantity stockpiled per FAA regulations for the past 17 years.

17 Year Record of AFFF Purchased and Used at Barnstable Municipal Airport

Year	AFFF Purchased (Gal.)	Approximate AFFF Used for Training (Gal.)	Approximate AFFF Used for Tri-Annual Drill (Gal.)	Approximate AFFF Used for Annual Testing (Gal.)	Approximate Total AFFF Used Annually (Gal.)	Approximate AFFF Stockpiled Based on Use* (Gal.)
2000	200	0	40	80	120	485
2001	0	0	0	80	80	325
2002	30	0	0	80	80	355
2003	40	0	40	80	120	325
2004	40	0	0	80	80	365
2005	0	0	0	80	80	325
2006	220	0	40	80	120	505
2007	25	0	0	80	80	350
2008	90	0	0	80	80	415
2009	90	0	40	80	120	375
2010	100	0	0	80	80	425
2011	180	0	0	80	80	505
2012	0	0	40	80	120	285
2013	0	0	0	80	80	325
2014	180	0	0	80	80	505
2015	265	80	40	80	200	470
2016**	250	0	0	80	80	575
17 Year Totals	1,710	80	240	1,360	1,680	

Notes:
* We are required by FAA regulations to have enough stockpiled AFFF on hand to resupply two (2) trucks. This is approximately 405 gallons.
** In May 2016, the Airport transitioned to the new formulation of Chemguard

Detailed AFFF Foam Purchases

Purchase Date	Qty.	Container Size (Gal.)	Purchased (Gal.)	Container Type	Description
3/20/2000	40	5	200	pail	Chem-Guard 3% mil-spec foam
4/11/2002	6	5	30	pail	Chem-Guard 3% mil-spec foam
3/18/2003	8	5	40	pail	Chem-Guard 3% mil-spec foam
2/23/2004	8	5	40	pail	Chem-Guard 3% mil-spec foam
9/19/2006	4	55	220	drum	Chem-Guard 3% mil-spec foam
4/27/2007	5	5	25	pail	Chem-Guard 3% mil-spec foam
5/2/2008	18	5	90	pail	Chem-Guard 3% mil-spec foam
"	18	5	90	pail	Purple-K Powder
5/13/2009	18	5	90	pail	Chem-Guard 3% mil-spec foam
"	18	5	90	pail	Purple K Powder
7/30/2010	20	5	100	pail	Chem-Guard 3% mil-spec foam
7/8/2011	36	5	180	pail	Chem-Guard 3% mil-spec foam
6/17/2014	36	5	180	pail	Chem-Guard 3% mil-spec foam
7/18/2014	36	5	180	pail	Purple-K Powder
6/23/2015	8	5	40	pail	Purple-K Powder
"	1	265	265	tote	Chem-Guard 3% mil-spec foam
2/12/2016	40	5	200	pail	Chem-Guard 3% mil-spec foam
6/16/2016	10	5	50	pail	Chem-Guard 3% mil-spec foam
Total Purchase Quantity - since 2000			**1,710**	**Gallons - Chem-Guard 3% mil-spec foam**	
Total Purchase Quantity - since 2000			**400**	**Gallons - Purple K Powder**	

Detailed ARFF Truck Inventory

Vehicle	Water (Gal.)	3% AFFF Concentrate Supply/Truck
#816	100	3
#817	1,500	205
#820	1,500	200
A 5-gallon container of 3% foam concentrate requires ~161.7 gal. of water to produce 166.7 gal. of foam solution.		
Example: 200 gallons of AFFF Concentrate/5 = 40 units 40 units x 161.7 gal. = 6,480 gal. of water to deplete 200 gal. of AFFF.		
Therefore, you would need to fill up truck #820 ~ 4 times to deplete AFFF that is stored on truck.		

EXHIBIT B

Safety Data Sheet

This safety data sheet complies with the requirements of: 2012 OSHA Hazard Communication Standard (29CFR 1910.1200)

Product name CHEMGUARD 3% AFFF C306-MS-C

1. Identification

1.1. Product Identifier

Product name	CHEMGUARD 3% AFFF C306-MS-C

1.2. Other means of identification

Product code	770809
Synonyms	None
Chemical Family	No information available

1.3. Recommended use of the chemical and restrictions on use

Recommended use	Fire extinguishing agent
Uses advised against	Consumer use

1.4. Details of the Supplier of the Safety Data Sheet

Company Name	Tyco Fire Protection Products One Stanton Street Marinette, WI 54143-2542 Telephone: 715-735-7411
Contact point	Product Stewardship at 1-715-735-7411
E-mail address	psra@tycofp.com

1.5. Emergency Telephone Number

Emergency telephone	CHEMTREC 800-424-9300 or 703-527-3887

2. Hazards Identification

Classification

OSHA Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Serious eye damage/eye irritation - Category 1

2.2. Label Elements

Signal Word

DANGER

hazard statements

Causes serious eye damage

Precautionary Statements

Prevention

Wear protective gloves/protective clothing/eye protection/face protection.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

2.3. Hazards Not Otherwise Classified (HNOC)

Not Applicable.

2.4. OTHER INFORMATION

Unknown Acute Toxicity 9.1297% of the mixture consists of ingredient(s) of unknown toxicity

3. Composition/information on Ingredients

3.1. Mixture

The following component(s) in this product are considered hazardous under applicable OSHA(USA)

Chemical name	CAS No	weight-%
2-(2-Butoxyethoxy)ethanol	112-34-5	10 - 30
Laurylamidopropyl betaine	4292-10-8	1 - 5
Caprylcaprilyl glucoside	68515-73-1	1 - 5
Fluorochemical Anionic Surfactant	Proprietary	1 - 5
Polyfluorinated alkyl polyamide	Proprietary	1 - 5
Octylphenoxypolyethoxyethanol	9036-19-5	1 - 5

4. First aid measures

4.1. Description of first aid measures

Eye Contact Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.

Skin contact Wash skin with soap and water. Get medical attention if irritation develops and persists.

Inhalation Remove to fresh air. If breathing is difficult, give oxygen. (Get medical attention immediately if symptoms occur.).

Ingestion Rinse mouth. Do not induce vomiting without medical advice. If swallowed, call a poison control center or physician immediately.

4.2. Most Important Symptoms and Effects, Both Acute and Delayed

Symptoms No information available.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

Note to physicians Treat symptomatically.

5. Fire-fighting measures

5.1. Suitable Extinguishing Media

Product is extinguishing agent. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2. Unsuitable Extinguishing Media
None.

5.3. Specific Hazards Arising from the Chemical
None known.

Hazardous Combustion Products Carbon oxides, Fluorinated oxides, Nitrogen oxides (NOx), Oxides of sulfur

5.4. Explosion Data

Sensitivity to Mechanical Impact None.
Sensitivity to Static Discharge None.

5.5. Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal Precautions Ensure adequate ventilation, especially in confined areas.

For emergency responders Use personal protection recommended in Section 8.

6.2. Environmental Precautions

Environmental Precautions Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers, basements or confined areas. See Section 12 for additional Ecological Information.

6.3. Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up Pick up and transfer to properly labeled containers.

7. Handling and Storage

7.1. Precautions for Safe Handling

Advice on safe handling Avoid contact with skin and eyes. Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place.

Incompatible Materials Strong oxidizing agents. Strong acids. Strong bases.

8. Exposure Controls/Personal Protection

8.1. Control Parameters

Exposure guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
2-(2-Butoxyethoxy)ethanol 112-34-5	TWA: 10 ppm inhalable fraction and vapor	-	-

ACGIH (American Conference of Governmental Industrial Hygienists) OSHA (Occupational Safety and Health Administration of the US Department of Labor) NIOSH IDLH Immediately Dangerous to Life or Health

8.2. Appropriate Engineering Controls

Engineering controls	Showers Eyewash stations Ventilation systems.

8.3. Individual protection measures, such as personal protective equipment

Eye/Face Protection	Avoid contact with eyes. Tight sealing safety goggles.
Skin and Body Protection	Wear protective gloves and protective clothing.
Respiratory Protection	If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.
Ventilation	Use local exhaust or general dilution ventilation to control exposure with applicable limits

8.4. General hygiene considerations

Do not eat, drink or smoke when using this product. Handle in accordance with good industrial hygiene and safety practice.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State	Liquid		
Odor	No data available	**Color**	No data available
odor threshold	No data available		

Property	**VALUES**	**Remarks • Method**
pH	No data available	
Melting point/freezing point	No data available	
Boiling point / boiling range	No data available	
Flash Point	No data available	
Evaporation Rate	No data available	
flammability (solid, gas)	No data available	
Flammability limit in air		
Upper flammability limit:	No data available	
Lower flammability limit:	No data available	
Vapor Pressure	No data available	
Vapor Density	No data available	
Specific gravity	No data available	
Water Solubility	No data available	
Solubility in Other Solvents	No data available	
Partition coefficient	No data available	
Autoignition Temperature	No data available	
Decomposition Temperature	No data available	
Kinematic viscosity	No data available	

10. Stability and Reactivity

10.1. Chemical Stability

Stable under recommended storage conditions.

10.2. Reactivity

No data available

10.3. Possibility of hazardous reactions

None under normal processing.

hazardous polymerization Hazardous polymerization does not occur.

10.4. Conditions to Avoid

Extremes of temperature and direct sunlight.

10.5. Incompatible Materials

Strong oxidizing agents. Strong acids. Strong bases.

10.6. Hazardous decomposition products

Carbon oxides. Nitrogen oxides (NOx). Oxides of sulfur. Fluorinated oxides.

11. Toxicological Information

11.1. Information on Likely Routes of Exposure

Product information no data available

INHALATION no data available.

Eye Contact no data available.

Skin contact no data available.

INGESTION no data available.

Acute Toxicity

Chemical name	Oral LD50	dermal LD50	Inhalation LC50
2-(2-Butoxyethoxy)ethanol 112-34-5	= 3384 mg/kg (Rat)	= 2700 mg/kg (Rabbit)	-
Laurylamidopropyl betaine 4292-10-8	> 2000 mg/kg (Rat)	-	-
Octylphenoxypolyethoxyethanol 9036-19-5	= 4190 mg/kg (Rat)	-	-

11.2. Information on Toxicological Effects

Symptoms No information available.

11.3. Delayed and immediate effects as well as chronic effects from short and long-term exposure

sensitization No information available.
Germ Cell Mutagenicity No information available
carcinogenicity No information available.

Reproductive Toxicity No information available.
STOT - Single Exposure No information available.
STOT - Repeated Exposure No information available.
Aspiration Hazard No information available.

11.4. Numerical Measures of Toxicity - Product information

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral) 12894 mg/kg
ATEmix (dermal) 14975 mg/kg

12. Ecological Information

12.1. ecotoxicity

1.8456% of the mixture consists of components(s) of unknown hazards to the aquatic environment

Chemical name	Algae/aquatic plants	Fish	Crustacea
2-(2-Butoxyethoxy)ethanol 112-34-5	EC50 96 h > 100 mg/L Desmodesmus subspicatus	LC50 96 h = 1300 mg/L Lepomis macrochirus static	EC50 24 h = 2850 mg/L Daphnia magna EC50 48 h > 100 mg/L Daphnia magna
2-Methyl-2,4-pentanediol 107-41-5	-	LC50 96 h 10500 - 11000 mg/L Pimephales promelas flow-through LC50 96 h = 10000 mg/L Lepomis macrochirus static LC50 96 h = 8690 mg/L Pimephales promelas flow-through LC50 96 h = 10700 mg/L Pimephales promelas static	EC50 48 h 2700 - 3700 mg/L Daphnia magna
t-Butanol 75-65-0	EC50 72 h > 1000 mg/L Desmodesmus subspicatus	LC50 96 h 6130 - 6700 mg/L Pimephales promelas flow-through	EC50 48 h = 933 mg/L Daphnia magna EC50 48 h 4607 - 6577 mg/L Daphnia magna Static
Polyethylene Glycol 25322-68-3	-	LC50 24 h > 5000 mg/L Carassius auratus	-
Sodium chloride 7647-14-5	-	LC50 96 h 5560 - 6080 mg/L Lepomis macrochirus flow-through LC50 96 h = 12946 mg/L Lepomis macrochirus static LC50 96 h 6020 - 7070 mg/L Pimephales promelas static LC50 96 h = 7050 mg/L Pimephales promelas semi-static LC50 96 h 6420 - 6700 mg/L Pimephales promelas static LC50 96 h 4747 - 7824 mg/L Oncorhynchus mykiss flow-through	EC50 48 h = 1000 mg/L Daphnia magna EC50 48 h 340.7 - 469.2 mg/L Daphnia magna Static
4,4'-bis-(sulfostyryl)-biphenyl disodium salt 27344-41-8	EC50 72 h = 10 mg/L Desmodesmus subspicatus EC50 96 h 10.0 - 11.0 mg/L Desmodesmus subspicatus	LC50 96 h = 76 mg/L Brachydanio rerio static	EC50 48 h = 1000 mg/L Daphnia magna

12.2. Persistence and Degradability

No information available.

12.3. Bioaccumulation

No information available.

12.4. Other Adverse Effects

No information available

13. Disposal Considerations

13.1. Waste Treatment Methods

Disposal of wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Do not reuse container.

14. Transport Information

DOT NOT REGULATED

TDG NOT REGULATED

MEX NOT REGULATED

ICAO (air) NOT REGULATED

IATA NOT REGULATED

IMDG NOT REGULATED

15. Regulatory Information

15.1. International Inventories

TSCA	Complies
DSL/NDSL	Does not comply
ENCS	Does not comply
IECSC	Does not comply
KECL	Does not comply
PICCS	Does not comply
AICS	Does not comply

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

15.2. US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical name	SARA 313 - Threshold Values %
2-(2-Butoxyethoxy)ethanol - 112-34-5	1.0

SARA 311/312 Hazard Categories

Acute Health Hazard	No
Chronic health hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No

Reactive Hazard No

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

15.3. US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
2-(2-Butoxyethoxy)ethanol 112-34-5	X	-	X

16. Other information, including date of preparation of the last revision

NFPA	**Health Hazards** 2	**flammability** 0	**Instability** 0	**Physical and chemical properties** -
HMIS	**Health Hazards** 2	**flammability** 0	**Physical Hazards** 0	**Personal Protection** X

Revision date 10-Oct-2015
Revision note
No information available
Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Chemguard Specialty Chemical and Fire Suppression Products

An Environmental Statement

Fluorine-containing organic surfactants, or fluorosurfactants, are used in everyday consumer and industrial products such as paints, waxes, cleaners, polishes, adhesives, inks and, notably, fire-fighting foams. There are no known substitutes that have the same functionality and outstanding performance characteristics. Often, fluorosurfactant products are misunderstood to be made from perfluorooctanoic acid (PFOA) or perfluorooctane sulfonate (PFOS), when in fact there are a large number of different types of fluorosurfactants in use.

Chemguard Specialty Chemical and Fire Suppression Products contain no significant levels of PFOA or PFOS. Neither PFOA nor PFOS is an intentional ingredient in any Chemguard products.

Over the past decade or so, there has been increasing concern about products that contain PFOA or PFOS. Both are thought to be persistent in the environment, bioaccumulative, and potentially toxic. The US Environmental Protection Agency became aware in the late 1990's that PFOS was found at very low levels in blood samples representing the general population.[1] However, studies show that blood levels have been declining in the past decades.[2] PFOA and PFOS are produced by the electrochemical fluorination (ECF) process practiced by several companies within the US and abroad, although, this production process is in decline. As a business decision based on precaution, 3M ceased commercial production of PFOS in 2002.[3]

However, given the scientific uncertainties regarding exposure routes and human health effects, the EPA does not believe there is any reason for consumers to stop using any consumer or industrial related products because of concerns about PFOA.[1] The limited, but still existing, stocks of such products are still allowed for use until supplies are exhausted.[4] Despite the low risks, the precautionary principle (i.e., caution due to uncertainty) requires that action be taken to further minimize any potential adverse effects these substances may pose. In 2006, the EPA initiated its "2010/15 PFOA Stewardship Program" in which industrial participants agree, in summary, to (1) reduce by 95% the product content and emissions of PFOA and precursor materials by 2010, and (2) eliminate such by 2015.

To distinguish PFOA and PFOS from fluorosurfactants that are in common use, it is necessary to have a sense of the chemical structures involved. Both PFOA and PFOS molecules contain a chain of 8 carbon atoms in which all the typical hydrogen atoms bonded to the carbons are substituted with fluorine atoms.[5] This chemical group is generally referred to as a "C8 perfluoroalkyl chain," or simply as "C8". The fluorine-carbon bond, also found in Teflon®[6]

products, is very strong, making the molecule resistant to degradation and adhesion. The C8 chain length has been preferred for fluorosurfactants because it gives optimum performance to a large number of product properties. Due to its common use, it has also received the most scrutiny, as mentioned above. The response by manufacturers, driven by EPA and other such regulatory authorities, has been to shift production to C6-based substances, which cannot degrade to C8. The EPA's 2010/15 PFOA Stewardship Program applies to all potential PFOA precursors, which includes C8 and longer chain lengths.

Furthermore, fluorosurfactants today are based on an entirely different production process, known as telomerization, as opposed to the ECF process mentioned above. Telomerization chemistry does not use or produce PFOS, however trace levels of PFOA may result as a byproduct. As a class, however, telomerization products have been shown in EPA studies to be neither toxic nor bioaccumulative.[7] Fluorosurfactants based on C6 telomerization chemistry cannot degrade into PFOA or PFOS.[8]

All Chemguard fluorosurfactants are derived from the telomerization process and are therefore substantially free of both PFOA and PFOS. Only trace levels of PFOA are present, and these originate as minor impurities in the raw materials that Chemguard relies on, as mentioned. At present, Chemguard Specialty Chemical products typically contain less than 5 ppm PFOA. As a practice, fluorosurfactant use in Fire Suppression foams is minimized by synergistic formulation with non-fluorinated surfactants and other components to provide maximum effectiveness. Therefore, Chemguard Fire Suppression foams typically contain less than 1 ppm PFOA. Chemguard is a participant in the EPA 2010/15 PFOA Stewardship Program and dedicated to ultimately eliminating C8 and longer chain chemistry from all products. As our conversion proceeds toward C6 chemistry, the PFOA level in our products is expected to fall well below 1 ppm, approaching the lower ppb level.

Chemguard is a conscientious and technology-driven company with a dedication to safety and product stewardship. We share the environmental concerns expressed by our customers and support the progressing regulatory environment in which we operate. We have the research, production and sales capabilities to respond with superior products that meet or exceed both our customers' expectations and our environmental responsibilities.

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1 Source: www.epa.gov/oppt/pfoa/pubs/pfoainfo.htm.

2 (a) Environmental Health Perspectives, v. 113, n. 5, May 2005,
(b) Source: www.cdc.gov/exposurereport/perfluorinated_compounds2.htm.

3 Source: solutions.3m.com/wps/portal/3M/en_US/PFOS/PFOA/Information/Action.

4 EU and Canada regulations specify deadlines for use.

5 PFOA contains a 7 carbon perfluoroalkyl group, with the organic acid functionality representing the 8th carbon.

6 Registered trademark of DuPont.

7 Industrial Fire Journal, Sept. 2007, p. 26.

8 International Fire Protection, August 2008, p. 29.

CHEMGUARD C306-MS 3% AFFF Concentrate

Description

CHEMGUARD C306-MS 3% AFFF (Aqueous Film-Forming Foam) Concentrate combines fluoro- and hydrocarbon-surfactant technology to provide superior fire and vapor suppression for Class B hydrocarbon fuel fires. This synthetic foam concentrate is intended for firefighting applications at 3% solution in fresh, salt, or hard water.

CHEMGUARD C306-MS foam solution utilizes three suppression mechanisms for rapid fire knockdown and enhanced burnback resistance:

- The foam blanket blocks oxygen supply to the fuel.
- Liquid drains from the foam blanket and forms an aqueous film that suppresses fuel vapor and seals the fuel surface.
- The water content of the foam solution produces a cooling effect for additional fire suppression.

TYPICAL PHYSIOCHEMICAL PROPERTIES AT 77 °F (25 °C)

Appearance	Pale yellow liquid
Density	1.02 ± 0.02 g/ml
pH	7.0 – 8.5
Refractive Index	1.3655 ± 0.0020
Viscosity	3.25 ± 1.0 cSt*
Spreading Coefficient	3.0 minimum at 3%
Pour Point	27 °F (-3 °C)
Freeze Point	27 °F (-3 °C)

*Cannon-Fenske viscometer at 25 °C

Application

CHEMGUARD C306-MS 3% AFFF Concentrate is intended for use on Class B hydrocarbon fuel fires having low water solubility such as crude oils, gasolines, diesel fuels, and aviation fuels. It is not suitable for use on polar fuels having appreciable water solubility, such as methyl and ethyl alcohol, acetone, and methyl ethyl ketone.

The concentrate has excellent wetting properties that can effectively combat Class A fires as well. It may also be used in conjunction with dry chemical agents to provide even greater fire suppression performance.

CHEMGUARD C306-MS Concentrate is ideal for fixed and emergency response firefighting systems designed to protect naval and aviation assets. Typical applications include:

- Military and civilian aircraft facilities
- Crash fire rescue (per US DOT FAA AC No. 150/5210-6D)
- On-board marine/naval fire suppression systems
- Storage tanks
- Docks/marine tankers

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Approvals, Listings, and Standards

CHEMGUARD C306-MS 3% AFFF Concentrate is approved, listed, qualified under, or meets the requirements of the following specifications and standards:

- US Department of Defense Military Specification
  - MIL-F-24385F: Fire Extinguishing Agent, Aqueous Film-Forming Foam (AFFF) Liquid Concentrate for Fresh and Sea Water.
- Underwriters Laboratories Inc. (UL)
  - UL Standard 162, Foam Liquid Concentrates
  - Fresh and Sea Water
- National Fire Protection Association (NFPA)
  - NFPA 403, Standard for Aircraft Rescue and Fire-Fighting Services at Airports
  - NFPA 409, Standard on Aircraft Hangars
  - NFPA 412, Standard for Evaluating Aircraft Rescue and Fire-Fighting Foam Fire Equipment
  - NFPA 414, Standard for Aircraft Rescue and Fire-Fighting Vehicles
  - NFPA 418, Standard for Heliports

Please contact Tyco Fire Protection Products Technical Services and/or refer to listing agency for current product and compatible hardware listings.

The environmentally-mindful CHEMGUARD C306-MS Concentrate formulation contains short-chain, C-6 fluoro-chemicals manufactured using a telomer-based process. The telomer process produces no PFOS, and these C-6 materials do not breakdown to yield PFOA. The fluorochemicals used in the concentrate meet the goals of the U.S. Environmental Protection Agency 2010/15 PFOA Stewardship Program.

ENVIRO-MINDED FORMULA C6

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Foaming Properties

CHEMGUARD C306-MS 3% AFFF Concentrate may be effectively applied using most conventional foam discharge equipment at 3% dilution with fresh, salt, or hard water. For optimum performance, water hardness should not exceed 500 ppm expressed as calcium and magnesium.

Because of the low energy required to create foam with CHEMGUARD C306-MS Concentrate, the foam solution may be applied with aspirating and non-aspirating discharge devices. Aspirating discharge devices typically produce expansion ratios from 3.5:1 to 10:1, depending on the type of device and the flow rate. Non-aspirating devices, such as handline water fog/stream nozzles or standard sprinkler heads, typically produce expansion ratios from 2:1 to 4:1. Medium-expansion discharge devices typically produce expansion ratios from 20:1 to 60:1.

TYPICAL FOAM CHARACTERISTICS (Fresh and Sea Water)**

Proportioning Rate	3%
Expansion Ratio LE	9.5
25% Drain Time (min:sec)	3:30
50% Drain Time (min:sec)	5:45

**per EN 1568-3, 2008 protocol

Proportioning

CHEMGUARD C306-MS 3% AFFF Concentrate can be correctly proportioned using most conventional, properly calibrated, in-line proportioning equipment such as:

- Balanced and in-line balanced pressure pump proportioners
- Balanced pressure bladder tanks and ratio flow controllers
- Around-the-pump type proportioners
- Fixed or portable in-line venturi type proportioners
- Handline nozzles with fixed eductor/pick-up tubes

For immediate use: The concentrate may also be diluted with fresh or sea water to a 3% pre-mix solution.

For delayed use: Consult Technical Services for guidance regarding suitability of a pre-mix solution (fresh water only).

Materials of Construction Compatibility

CHEMGUARD C306-MS Concentrate compatibility with HDPE has been successfully evaluated using ASTM D1693-70 protocol under UL-162 standard. Concentrate corrosion studies with cold-rolled carbon steel (UNS G10100), 90-10 copper-nickel (UNS C70600), 70-30 nickel-copper (UNC N04400), bronze (UNS C90500), and CRES steel (UNS S30400) have been successfully completed per ASTM E527 protocol under MIL-F-24385F specification.

To avoid corrosion, galvanized pipe and fittings should never be used in contact with undiluted concentrate. Please refer to Technical Bulletin No. 59 for recommendations and guidance regarding compatibility of CHEMGUARD concentrates with common materials of construction in the firefighting foam industry.

Storage and Handling

CHEMGUARD C306-MS 3% AFFF Concentrate should be stored in the original supplied package (HDPE totes, drums, or pails) or in the foam system equipment recommended by Technical Services. The product should be maintained within the recommended 35 °F to 120 °F (2 °C to 49 °C) operational temperature range. If the concentrate freezes during transport or storage, full product serviceability can be restored upon thaw with gentle re-mixing.

Factors affecting the foam concentrate long-term effectiveness include temperature exposure and cycling, storage container, air exposure, evaporation, dilution, and contamination. The effective life of CHEMGUARD C306-MS Concentrate can be maximized through optimal storage conditions and proper handling.

CHEMGUARD foam concentrates have demonstrated effective firefighting performance with contents stored in the original package under proper conditions for more than 10 years.

CHEMGUARD C306-MS 3% AFFF Concentrate has been successfully evaluated by the US Naval Sea Systems Command for prolonged compatibility with other 3% AFFF concentrates qualified under MIL-F-24385F specification.

- Mixing with foam concentrates not vetted by MIL-F-24385F is not recommended.
- For immediate incident response, it is appropriate to use the concentrate in conjunction with comparable 3% AFFF products.

Inspection

CHEMGUARD C306-MS 3% AFFF Concentrate should be inspected periodically per NFPA 11 “Standard for Low-, Medium-, and High-Expansion Foam,” EN 13565-2 “Foam System Standard,” or other relevant standard. A representative concentrate sample should be sent to Tyco Fire Protection Products Foam Analytical Services or other qualified laboratory for quality analysis per the applicable standard. An annual inspection and sample analysis is typically sufficient, unless the product has been exposed to unusual conditions.

Ordering Information

Concentrate is available in commercial packaging only under CHEMGUARD C306-MS-C product designation and is not available for direct, contract government acquisition (per MIL-F-24385F packaging provision). Concentrate is available in pails, drums, totes or bulk shipment, with pail and drum containers being UL-162 compliant.

Part No.	Description	Shipping Weight	Cube
770809	Pail 5 gal (19 L)	45 lb (20.4 kg)	1.25 ft^3 (0.0353 m^3)
770810	Drum 55 gal (208 L)	495 lb (224.5 kg)	11.83 ft^3 (0.3350 m^3)
770811	Tote 265 gal (1000 L)	2463 lb (1117 kg)	50.05 ft^3 (1.42 m^3)

Safety Data Sheet (SDS) available at www.chemguard.com

Note: The converted metric values in this document are provided for dimensional reference only and do not reflect an actual measurement.

CHEMGUARD, and the product names listed in this material are marks and/or registered marks. Unauthorized use is strictly prohibited.

Old Foam

CHEMGUARD

Safety Data Sheet

This safety data sheet complies with the requirements of: 2012 OSHA Hazard Communication Standard (29CFR 1910.1200)

Product name CHEMGUARD C301MS

1. Identification

1.1. Product Identifier
Product name: CHEMGUARD C301MS

1.2. Other means of identification
Product code: C301D
Synonyms: None
Chemical Family: Fire fighting foam, surfactant

1.3. Recommended use of the chemical and restrictions on use
Recommended use: Fire extinguishing agent
Uses advised against: None known

1.4. Details of the Supplier of the Safety Data Sheet
Company Name: Chemguard, Inc
204 South 8th Ave
Mansfield, TX 76063
Telephone: 817-473-9954
www.chemguard.com

Contact point: Product Stewardship at 1-715-735-7411
E-mail address: para@tycofp.com

1.5. Emergency Telephone Number
Emergency telephone: CHEMTREC 800-424-9300 or 703-527-3887

2. Hazards identification

Classification
OSHA Regulatory Status
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Serious eye damage/eye irritation - Category 1

2.2. Label Elements
Signal Word
DANGER

Hazard statements
Causes serious eye damage

Precautionary Statements

Prevention
Wear protective gloves/protective clothing/eye protection/face protection.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

2.3. Hazards Not Otherwise Classified (HNOC)

Not Applicable.

2.4. OTHER INFORMATION

Unknown Acute Toxicity: 4.91435% of the mixture consists of ingredient(s) of unknown toxicity

3. Composition/information on ingredients

3.1. Mixture

The following component(s) in this product are considered hazardous under applicable OSHA(USA)

Chemical name	CAS No	weight-%
Sucrose	57-50-1	5 - 10
Sodium Octyl Sulfate	142-31-4	3 - 7
2-(2-Butoxyethoxy)ethanol	112-34-5	1 - 5
Anionic Fluorinated Surfactant	Proprietary	1 - 5
Perfluoro Telomer	Proprietary	1 - 5
Ethylene Diamine Tetraacetic Acid, Sodium Salt	64-02-8	1 - 5
Magnesium Sulfate Heptahydrate	10034-99-8	1 - 5

4. First aid measures

4.1. Description of first aid measures
General Advice: Keep victim under observation. Move victim to a safe isolated area. Move victim to fresh air. Remove contaminated clothing and shoes.

Eye Contact: Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.

Skin contact: Wash skin with soap and water. Get medical attention if irritation develops and persists.

Inhalation: Remove to fresh air. If breathing is difficult, give oxygen. (Get medical attention immediately if symptoms occur.).

Ingestion: Rinse mouth. Do not induce vomiting without medical advice. If swallowed, call a poison control center or physician immediately.

4.2. Most important Symptoms and Effects, Both Acute and Delayed
Symptoms: No information available.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed
Note to physicians: Treat symptomatically.

5. Fire-fighting measures

5.1. Suitable Extinguishing Media
Product is extinguishing agent. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2. Unsuitable Extinguishing Media
None.

5.3. Specific Hazards Arising from the Chemical
None known.
Hazardous Combustion Products: Carbon oxides, Fluorinated oxides, Nitrogen oxides (NOx), Oxides of sulfur

5.4. Explosion Data
Sensitivity to Mechanical Impact: None.
Sensitivity to Static Discharge: None.

5.5. Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Personal Precautions: Ensure adequate ventilation, especially in confined areas.

For emergency responders: Use personal protection recommended in Section 8.

6.2. Environmental Precautions
Environmental Precautions: Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers, basements or confined areas. See Section 12 for additional Ecological Information.

6.3. Methods and material for containment and cleaning up
Methods for Containment: Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up: Pick up and transfer to properly labeled containers.

7. Handling and Storage

7.1. Precautions for Safe Handling

Advice on safe handling: Avoid contact with skin and eyes. Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions: Keep containers tightly closed in a dry, cool and well-ventilated place.

Incompatible Materials: Strong oxidizing agents. Strong acids. Strong bases.

8. Exposure Controls/Personal Protection

8.1. Control Parameters

Exposure guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Sucrose 57-50-1	TWA: 10 mg/m³	-	TWA: 10 mg/m³ total dust TWA: 5 mg/m³ respirable dust
2-(2-Butoxyethoxy)ethanol 112-34-5	TWA: 10 ppm inhalable fraction and vapor	-	-

Immediately Dangerous to Life or Health

8.2. Appropriate Engineering Controls

Engineering controls: Showers
Eyewash stations
Ventilation systems.

8.3. Individual protection measures, such as personal protective equipment

Eye/Face Protection: Avoid contact with eyes. Tight sealing safety goggles.

Skin and Body Protection: Wear protective gloves and protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

Ventilation: Use local exhaust or general dilution ventilation to control exposure with applicable limits

8.4. General hygiene considerations
Do not eat, drink or smoke when using this product. Handle in accordance with good industrial hygiene and safety practice.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State	Liquid		
Odor	Slight	Color	Clear Yellow
odor threshold	No data available		

Property	VALUES	Remarks • Method
pH	7.7 - 8.7	
Melting point/freezing point	0 °C / 32 °F	
Boiling point / boiling range	100 °C / 212 °F	
Flash Point	> 100 °C / > 212 °F	
Evaporation Rate	No data available	
flammability (solid, gas)	No data available	
Flammability limit in air		
Upper flammability limit	No data available	
Lower flammability limit	No data available	
Vapor Pressure	No data available	
Vapor Density	No data available	
Specific gravity	1.00 - 1.25	
Water Solubility	Completely soluble	
Solubility in Other Solvents	No data available	
Partition coefficient	No data available	

Autoignition Temperature	No data available
Decomposition Temperature	No data available
Kinematic viscosity	No data available

10. Stability and Reactivity

10.1. Chemical Stability

Stable under recommended storage conditions.

10.2. Reactivity

No data available

10.3. Possibility of hazardous reactions

None under normal processing.

Hazardous polymerisation — Hazardous polymerization does not occur.

10.4. Conditions to Avoid

Extremes of temperature and direct sunlight.

10.5. Incompatible Materials

Strong oxidizing agents. Strong acids. Strong bases.

10.6. Hazardous decomposition products

Carbon oxides. Nitrogen oxides (NOx). Oxides of sulfur. Fluorinated oxides.

11. Toxicological Information

11.1. Information on Likely Routes of Exposure

Product Information — no data available

INHALATION — no data available.

Eye Contact — no data available.

Skin contact — no data available.

INGESTION — no data available.

Acute Toxicity

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Sucrose 57-50-1	= 29700 mg/kg (Rat)	-	-
Sodium Octyl Sulfate 142-31-4	= 3200 mg/kg (Rat)	-	-
2-(2-Butoxyethoxy)ethanol 112-34-5	= 3384 mg/kg (Rat)	= 2700 mg/kg (Rabbit)	-
Anionic Fluorinated Surfactant	> 10,000 ppm (Rat)	-	-

Ethylene Diamine Tetraacetic Acid, Sodium Salt 64-02-8	= 1658 mg/kg (Rat) = 10 g/kg (Rat)	-	-

11.2. Information on Toxicological Effects

Symptoms — No information available.

11.3. Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin Corrosion/Irritation	Mild irritant (rabbit)
Serious eye damage/eye irritation	Mild irritant (rabbit)
sensitization	No information available.
Germ Cell Mutagenicity	No information available
carcinogenicity	This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.
Reproductive Toxicity	No information available.
STOT - Single Exposure	No information available.
STOT - Repeated Exposure	No information available.
Target organ effects	EYES, Respiratory System.
Aspiration Hazard	No information available.

11.4. Numerical Measures of Toxicity - Product Information

The following values are calculated based on chapter 3.1 of the GHS document mg/kg

12. Ecological Information

12.1. ecotoxicity

8.2010811% of the mixture consists of components(s) of unknown hazards to the aquatic environment

Chemical name	Algae/aquatic plants	Fish	Crustacea
2-(2-Butoxyethoxy)ethanol 112-34-5	EC50 96 h > 100 mg/L Desmodesmus subspicatus	LC50 96 h = 1300 mg/L Lepomis macrochirus static	EC50 24 h = 2850 mg/L Daphnia magna EC50 48 h > 100 mg/L Daphnia magna
Ethylene Diamine Tetraacetic Acid, Sodium Salt 64-02-8	EC50 72 h = 1.01 mg/L Desmodesmus subspicatus	LC50 96 h = 41 mg/L Lepomis macrochirus static LC50 96 h = 59.8 mg/L Pimephales promelas static	EC50 24 h = 610 mg/L Daphnia magna
2-Methyl-2,4-pentanediol 107-41-5	-	LC50 96 h 10600 - 11900 mg/L Pimephales promelas flow-through LC50 96 h = 10000 mg/L Lepomis macrochirus static LC50 96 h = 8850 mg/L Pimephales promelas flow-through LC50 96 h = 10700 mg/L Pimephales promelas static	EC50 48 h 2700 - 3000 mg/L Daphnia magna
1-Butanol 71-36-3	EC50 72 h > 1000 mg/L Desmodesmus subspicatus	LC50 96 h 5130 - 8700 mg/L Pimephales promelas flow-through	EC50 48 h = 933 mg/L Daphnia magna EC50 48 h 4607 - 6577 mg/L Daphnia magna Static
Sodium Hydroxide 1310-73-2	-	LC50 96 h = 454 mg/L Oncorhynchus mykiss static	-
Polyethylene Glycol 25322-68-3	-	LC50 24 h > 5000 mg/L Carassius auratus	-

Trisodium ethylenediaminetetraacetate 5064-31-3	EC50 96 h 560 - 1000 mg/L Chlorella vulgaris	LC50 96 h 83 - 170 mg/L Pimephales promelas flow-through LC50 96 h 175 - 225 mg/L Lepomis macrochirus static LC50 96 h = 252 mg/L Lepomis macrochirus LC50 96 h = 470 mg/L Pimephales promelas static LC50 96 h 560 - 1000 mg/L Oryzias latipes LC50 96 h 560 - 1000 mg/L Oryzias latipes semi-static LC50 96 h 72 - 132 mg/L Oncorhynchus mykiss static LC50 96 h 560 - 1000 mg/L Poecilia reticulata semi-static LC50 96 h 560 - 1000 mg/L Poecilia reticulata LC50 96 h = 114 mg/L Pimephales promelas	LC50 48 h 560 - 1000 mg/L Daphnia magna
5-Chloro-2-methyl-4-isothiazolin-3-one 26172-55-4	EC50 72 h 0.11 - 0.16 mg/L Pseudokirchneriella subcapitata static EC50 96 h 0.03 - 0.13 mg/L Pseudokirchneriella subcapitata static EC50 120 h = 0.31 mg/L Anabaena flos-aquae	LC50 96 h = 1.6 mg/L Oncorhynchus mykiss semi-static	EC50 48 h = 4.71 mg/L Daphnia magna EC50 48 h 0.12 - 0.3 mg/L Daphnia magna Flow-through EC50 48 h 0.71 - 0.99 mg/L Daphnia magna Static

species — Pimephales promelas
Endpoint type — LC50
Effective dose — 1134 mg/l
Exposure time — 96 hours

species — Daphnia magna
Endpoint type — LC50
Effective dose — 1016 mg/l
Exposure time — 48 hours

12.2. Persistence and Degradability

Chemical Oxygen Demand	260,544 mg/l
Biological Oxygen Demand (5 Day)	330,890 mg/l
Biodegradability (B.O.D./C.O.D.)	88.9 %

12.3. Bioaccumulation

No information available.

12.4. Other Adverse Effects

No information available

13. Disposal Considerations

13.1. Waste Treatment Methods

Disposal of wastes — Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging — Do not reuse container.

14. Transport Information

DOT	NOT REGULATED
TDG	NOT REGULATED
MEX	NOT REGULATED
ICAO (air)	NOT REGULATED
IATA	NOT REGULATED
IMDG	NOT REGULATED

15. Regulatory Information

15.1. International Inventories

TSCA	Complies
DSL/NDSL	Complies
ENCS	Does not comply
IECSC	Does not comply
KECL	Does not comply
PICCS	Does not comply
AICS	Complies

Legend:
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

15.2. US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical name	SARA 313 - Threshold Values %
2-(2-Butoxyethoxy)ethanol - 112-34-5	1.0

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic health hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

15.3. US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
2-(2-Butoxyethoxy)ethanol 112-34-5	X	-	X
Trisodium dihydrogen EDTA 5964-35-2	-	X	-
Magnesium Nitrate 10377-60-3	X	X	X

16. Other information, including date of preparation of the last revision

NFPA	Health Hazards 1	flammability 1	Instability 0	Physical and chemical properties -
HMIS	Health Hazards 1	flammability 1	Physical Hazards 0	Personal Protection X

Revision date 25-May-2015

Revision note

No information available

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

EXHIBIT C

Horsley Witten Group
Sustainable Environmental Solutions
90 Route 6A • Unit 1 • Sandwich, MA 02563
508-833-6600 • horsleywitten.com

MEMORANDUM

TO: Mr. Roland Breault, Airport Manager

FROM: Mark Nelson, P.G., Joseph Longo, Gary Hedman

DATE: September 7, 2016

RE: August 4, 2016 Request for Information / Interim Deadline

CC: Katie Servis, Assistant Airport Manager

Anderson & Kreiger, LLP

On behalf of the Barnstable Municipal Airport (the Airport), the Horsley Witten Group, Inc. (HW) has prepared this summary of groundwater sampling activities and supporting information in response to an August 4, 2016 Request for Information (RFI) / Interim Deadline notice issued to the Airport by the Massachusetts Department of Environmental Protection (MassDEP).

The RFI was issued by MassDEP following the detection of perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), collectively referred to as perfluoroalkyl substances, or PFAS, in samples collected from public water supply wells (PWS). The RFI identifies aqueous film forming foam (AFFF), which is used at airports throughout the Commonwealth, as a potential source of PFAS and the basis of the RFI.

This summary is intended to provide information relative to requests 10 and 11 in Attachment A of the RFI.

10. Identify the location of any on site groundwater supply wells at Barnstable Municipal Airport

There is currently one Public Water Supply (PWS) well located on Airport property (Figure 1). Airport -1 is located to the north of the airfield. The Maher Wellfield PWS wells ME-1, ME-2, and ME-3 are located southeast of Airport property. Zones of contribution (Zone 2) to area PWS locations are indicated on Figure 2. All of these PWS are operated by the Hyannis Water District.

11. Have you ever sampled groundwater at the Barnstable Municipal Airport for perfluoroalkyl substances? If so, include the results of that sampling. And, if so, provide the analytical data and well construction details (if groundwater was sampled).

On behalf of the Airport and in conjunction with the Town of Barnstable Department of Public Works (DPW), HW completed a groundwater sampling event in July 2016 prior to the issuance of the RFI to evaluate whether or not PFAS were present within the aquifer below the Airport.

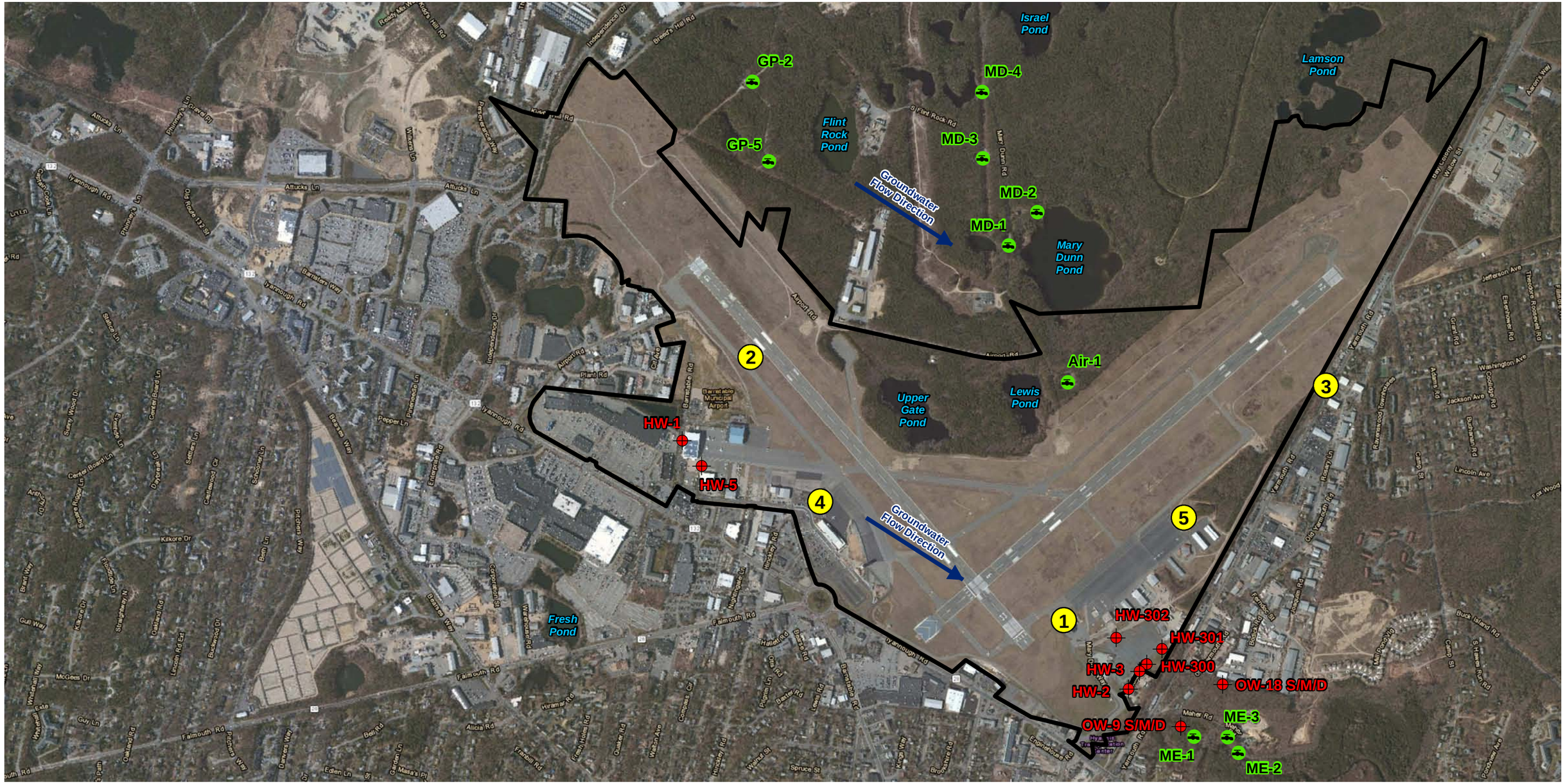
On July 1st and 5th, 2016, HW staff collected groundwater samples from six monitoring wells located on Airport property, and two multi-level monitoring wells at the Hyannis Water District's Maher wellfield (Figure 2). Each monitoring well was developed using a submersible pump and disposable tubing. A minimum of three well volumes was removed from each well prior to sample collection with a disposable polyethylene bailer. An equipment blank and duplicate sample were also collected as a quality control measure. Samples were submitted to Eurofins Eaton Analytical, of South Bend, Indiana, for analysis of PFAS.

In May of 2016, the United States Environmental Protection Agency (EPA) issued a lifetime drinking water Health Advisory (HA) for PFAS of 0.07 micrograms per liter (ug/L), or parts per billion (PPB), either individually as PFOA or PFOS, or when the concentrations are combined. A Health Advisory identifies the concentration of a contaminant in drinking water at which adverse health effects are not anticipated to occur.

Laboratory analysis indicated the presence of PFAS in every groundwater sample that was collected, including locations that are located hydrologically upgradient of the airfield on the North Ramp (monitoring well HW-1), an area where AFFF has not been deployed by the Airport. Laboratory results are summarized in Table 1 and complete laboratory analytical reports are attached in Exhibit D. Where available, boring logs for the monitoring wells are also attached.

In samples collected from HW-5, located on the North Ramp of the Airport, and HW-3, located in a unpaved parking lot operated by the Airport, combined concentrations of PFOA and PFOS were detected at 0.151 and 0.093 ug/L, respectively.

As a confirmatory measure, HW staff collected a second round of groundwater samples from monitoring wells HW-5 and HW-3 on August 10, 2016, using the same sampling protocols described above. Combined concentrations of PFOA and PFOS were again detected at 0.121 and 0.160 ug/L, respectively.



Path: H:\Projects\HYA\14105 BMA On-Call Eng Services\GIS\Maps\160810_GroundwaterSampling_Maher.mxd

Legend

- Monitoring Wells
- Drinking Water Wells
- Barnstable Municipal Airport Property Boundary

1. ARFF/SRE Building
2. 1991 Tri-Annual Drill location
3. 1981 Beech 18 aircraft accident location
4. 2016 Cirrus R22 aircraft accident location
5. AFFF Deployment Location

N

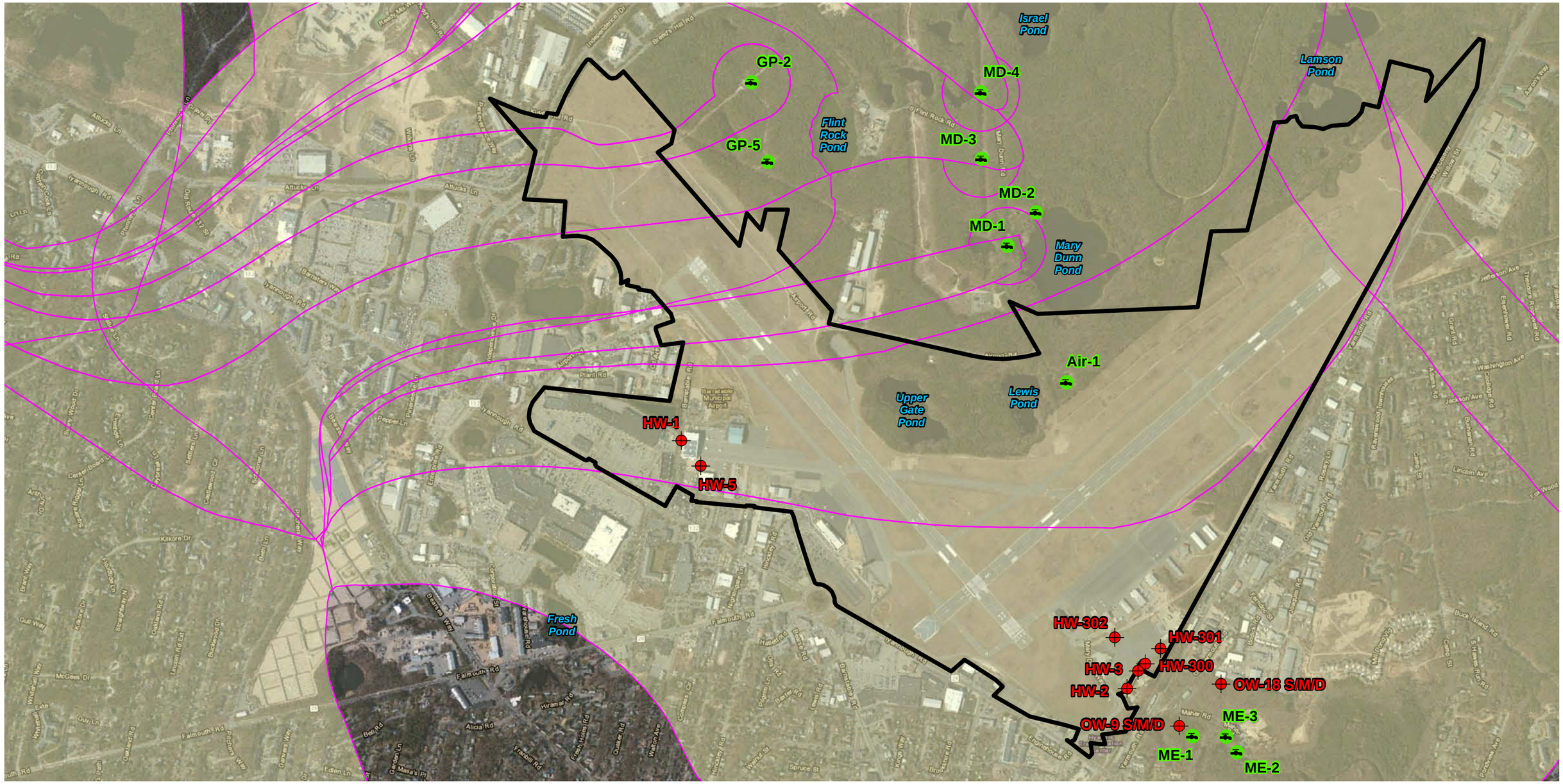
0 1,000

1" = 1,000 Feet

Horsley Witten Group
Sustainable Environmental Solutions
90 Route 6A • Unit 1 • Sandwich, MA 02563
508-833-6600 • horsleywitten.com

Barnstable Municipal Airport Hyannis, MA

Date: 9/13/2016 Figure 1



Path: H:\Projects\HYA\14105 BMA On-Call Eng Services\GIS\Maps\160831_ZoneII.mxd

Legend

- Monitoring Wells
- Drinking Water Wells
- Barnstable Municipal Airport Property Boundary
- Approved Wellhead Protection Areas (Zone II)

N

0 1,000

1" = 1,000 Feet

Horsley Witten Group
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Barnstable Municipal Airport Hyannis, MA

Date: 9/13/2016 Figure 2

EXHIBIT D

Groundwater Sampling Results
Barnstable Municipal Airport and Maher Wellfield Monitoring Wells
September 2016

			North Ramp			Steamship Parking Lot					
			HW-1	HW-5		HW-2	HW-3		HW-300	HW-301	HW-302
	Units	Method Reporting Limit	7/1/2016	7/1/2016	8/10/2016	7/1/2016	7/1/2016	8/10/2016	7/1/2016	7/1/2016	7/1/2016
Perfluorobutanesulfonic acid (PFBS)	ug/L	0.009	0.009 (ND)	0.009 (ND)	0.009 (ND)	0.009 (ND)	0.009 (ND)	0.009 (ND)	0.009 (ND)	0.009 (ND)	0.009 (ND)
Perfluoroheptanoic acid (PFHpA)	ug/L	0.001	0.010	0.004	0.003	0.007	0.016	0.074	0.009	0.002	0.019
Perfluorohexanesulfonic acid (PFHxS)	ug/L	0.003	0.018	0.011	0.008	0.003	0.004	0.009	0.012	0.038	0.006
Perfluorononanoic acid (PFNA)	ug/L	0.002	0.002 (ND)	0.002 (ND)	0.002	0.002 (ND)	0.006	0.013	0.002 (ND)	0.002 (ND)	0.054
Perfluorooctane sulfonate (PFOS)	ug/L	0.004	0.017	**0.12**	**0.1**	0.012	**0.084**	**0.12**	0.017	0.011	0.014
Perfluorooctanoic acid (PFOA)	ug/L	0.002	0.033	0.031	0.021	0.006	0.009	0.04	0.005	0.004	0.033
Combined PFOA and PFOS	ug/L	NA	0.05	**0.151**	**0.121**	0.018	**0.093**	**0.16**	0.022	0.015	0.047

			Maher Wells						Quality Control		
			OW-9S	OW-9D	OW-18S	OW-18M	OW-18D	OW-18D Duplicate	Field Trip Blank	Water Blank	Equip. Blank
	Units	Method Reporting Limit	7/5/2016	7/5/2016	7/5/2016	7/5/2016	7/5/2016	7/5/2016	7/5/2016	7/1/2016	7/1/2016
Perfluorobutanesulfonic acid (PFBS)	ug/L	0.009	0.009 (ND)	0.009 (ND)	0.009 (ND)	0.009 (ND)	0.009 (ND)	0.009 (ND)	0.009 (ND)	0.009 (ND)	0.009 (ND)
Perfluoroheptanoic acid (PFHpA)	ug/L	0.001	0.014	0.003	0.007	0.003	0.007	0.006	0.001 (ND)	0.001 (ND)	0.001 (ND)
Perfluorohexanesulfonic acid (PFHxS)	ug/L	0.003	0.003 (ND)	0.012	0.007	0.016	0.01	0.011	0.003 (ND)	0.003 (ND)	0.003
Perfluorononanoic acid (PFNA)	ug/L	0.002	0.008	0.003	0.002 (ND)	0.007	0.006	0.006	0.002 (ND)	0.002 (ND)	0.002 (ND)
Perfluorooctane sulfonate (PFOS)	ug/L	0.004	0.007	0.041	0.008	0.044	0.018	0.019	0.004 (ND)	0.004 (ND)	0.004 (ND)
Perfluorooctanoic acid (PFOA)	ug/L	0.002	0.007	0.005	0.018	0.006	0.006	0.006	0.002 (ND)	0.002 (ND)	0.002 (ND)
Combined PFOA and PFOS	ug/L	NA	0.014	0.046	0.026	0.05	0.024	0.025	0.002 (ND)	0.002 (ND)	0.002 (ND)

Notes:
All samples collected by Horsley Witten Group, Inc., and analyzed by Eurofins Eaton Analytical, South Bend, Indiana
ND - Analyte not detected above the Method Reporting Limit
ug/L - micrograms per liter or parts per billion
Bold text and shaded box denotes analyte, or combined concentration of PFOA and PFOS, was detected above U.S. Environmental Protection Agency Drinking Water Health Advisory level of .07 ug/L

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LABORATORY REPORT

If you have any questions concerning this report, please do not hesitate to call us at (800) 332-4345 or (574) 233-4777.

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STATE CERTIFICATION LIST

State	Certification	State	Certification
Alabama	40700	Montana	CERT0026
Alaska	IN00035	Nebraska	E87775
Arizona	AZ0432	Nevada	IN00035
Arkansas	IN00035	New Hampshire*	2124
California	2920	New Mexico	IN00035
Colorado	IN035	New Jersey*	IN598
Colorado Radiochemistry	IN035	New York*	11398
Connecticut	PH-0132	North Carolina	18700
Delaware	IN035	North Dakota	R-035
Florida*	E87775	Ohio	87775
Georgia	929	Oklahoma	D9508
Hawaii	IN035	Oregon (Primary AB)*	4074-001
Idaho	IN00035/E87775	Pennsylvania*	68-00466
Illinois*	200001	Puerto Rico	IN00035
Illinois Microbiology	200001	Rhode Island	LAO00343
Indiana Chemistry	C-71-01	South Carolina	95005
Indiana Microbiology	M-76-07	South Dakota	IN00035
Iowa	098	Tennessee	TN02973
Kansas*	E-10233	Texas*	T104704187-15-8
Kentucky	90056	Texas/TCEQ	TX207
Louisiana*	LA160002	Utah*	IN00035
Maine	IN00035	Vermont	VT-8775
Maryland	209	Virginia*	460275
Massachusetts	M-IN035	Washington	C837
Michigan	9926	West Virginia	9927 C
Minnesota*	018-999-338	Wisconsin	999766900
Mississippi	IN035	Wyoming	IN035
Missouri	880		

*NELAP/TNI Recognized Accreditation Bodies

Revision date: 04/14/2016

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LABORATORY CASE NARRATIVE

Client: Horsley & Witten Report #: 366953CN

All method QC was within acceptance limits.

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C.S. Manager 07/22/2016

Authorized Signature Title Date

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110 South Hill Street
South Bend, IN 46617
Tel: (574) 233-4777
Fax: (574) 233-8207
1 800 332 4345

Laboratory Report

Client: Horsley & Witten

Attn: Gary Hedman
90 Route 6A
Sandwich, MA 02563

Report: 366953
Priority: Standard Written
Status: Final
PWS ID: Not Supplied

Sample Information

EEA ID #	Client ID	Method	Collected Date / Time	Collected By:	Received Date / Time
3487561	HW-1	537	07/01/16 08:50	Client	07/07/16 08:45
3487562	HW-5	537	07/01/16 09:35	Client	07/07/16 08:45
3487563	HW-302	537	07/01/16 10:15	Client	07/07/16 08:45
3487564	HW-2	537	07/01/16 10:40	Client	07/07/16 08:45
3487565	HW-3	537	07/01/16 11:10	Client	07/07/16 08:45
3487566	HW-300	537	07/01/16 12:20	Client	07/07/16 08:45
3487567	HW-301	537	07/01/16 12:45	Client	07/07/16 08:45
3487569	Water Blank	537	07/01/16 13:55	Client	07/07/16 08:45
3487570	FEB	537	07/01/16 14:00	Client	07/07/16 08:45
3487571	OW-9D	537	07/05/16 12:50	Client	07/07/16 08:45
3487572	OW-9S	537	07/05/16 13:15	Client	07/07/16 08:45
3487573	OW-18S	537	07/05/16 15:10	Client	07/07/16 08:45
3487574	OW-18M	537	07/05/16 15:50	Client	07/07/16 08:45
3487575	OW-18D	537	07/05/16 16:55	Client	07/07/16 08:45
3487577	OW-18D Dup	537	07/05/16 16:55	Client	07/07/16 08:45

Report Summary

Detailed quantitative results are presented on the following pages. The results presented relate only to the samples provided for analysis.

We appreciate the opportunity to provide you with this analysis. If you have any questions concerning this report, please do not hesitate to call Nathan Trowbridge at (574) 233-4777.

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Authorized Signature | Title | 07/22/2016 Date

Client Name: Horsley & Witten
Report #: 366953

Client Name: Horsley & Witten Report #: 366953

Sampling Point: HW-1 PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	07/15/16 06:55	07/16/16 00:37	3487561
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	**10**	ng/L	07/15/16 06:55	07/16/16 00:37	3487561
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	**18**	ng/L	07/15/16 06:55	07/16/16 00:37	3487561
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	< 2.0	ng/L	07/15/16 06:55	07/16/16 00:37	3487561
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	**17**	ng/L	07/15/16 06:55	07/16/16 00:37	3487561
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	**33**	ng/L	07/15/16 06:55	07/16/16 00:37	3487561

Sampling Point: HW-5 PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	07/15/16 06:55	07/16/16 01:07	3487562
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	**4.1**	ng/L	07/15/16 06:55	07/16/16 01:07	3487562
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	**11**	ng/L	07/15/16 06:55	07/16/16 01:07	3487562
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	< 2.0	ng/L	07/15/16 06:55	07/16/16 01:07	3487562
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	**120**	ng/L	07/15/16 06:55	07/16/16 01:07	3487562
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	**31**	ng/L	07/15/16 06:55	07/16/16 01:07	3487562

Sampling Point: HW-302 PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	07/15/16 06:55	07/16/16 01:38	3487563
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	**19**	ng/L	07/15/16 06:55	07/16/16 01:38	3487563
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	**6.3**	ng/L	07/15/16 06:55	07/16/16 01:38	3487563
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	**54**	ng/L	07/15/16 06:55	07/16/16 01:38	3487563
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	**14**	ng/L	07/15/16 06:55	07/16/16 01:38	3487563
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	**33**	ng/L	07/15/16 06:55	07/16/16 01:38	3487563

Client Name: Horsley & Witten Report #: 366953

Sampling Point: HW-2 PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	07/15/16 06:55	07/16/16 02:09	3487564
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	**7.1**	ng/L	07/15/16 06:55	07/16/16 02:09	3487564
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	**3.5**	ng/L	07/15/16 06:55	07/16/16 02:09	3487564
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	< 2.0	ng/L	07/15/16 06:55	07/16/16 02:09	3487564
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	**12**	ng/L	07/15/16 06:55	07/16/16 02:09	3487564
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	**6.3**	ng/L	07/15/16 06:55	07/16/16 02:09	3487564

Sampling Point: HW-3 PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	07/15/16 06:55	07/16/16 02:40	3487565
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	**16**	ng/L	07/15/16 06:55	07/16/16 02:40	3487565
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	**4.3**	ng/L	07/15/16 06:55	07/16/16 02:40	3487565
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	**6.3**	ng/L	07/15/16 06:55	07/16/16 02:40	3487565
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	**84**	ng/L	07/15/16 06:55	07/16/16 02:40	3487565
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	**9.1**	ng/L	07/15/16 06:55	07/16/16 02:40	3487565

Sampling Point: HW-300 PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	07/15/16 06:55	07/16/16 03:10	3487566
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	**9.6**	ng/L	07/15/16 06:55	07/16/16 03:10	3487566
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	**12**	ng/L	07/15/16 06:55	07/16/16 03:10	3487566
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	< 2.0	ng/L	07/15/16 06:55	07/16/16 03:10	3487566
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	**17**	ng/L	07/15/16 06:55	07/16/16 03:10	3487566
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	**5.2**	ng/L	07/15/16 06:55	07/16/16 03:10	3487566

Client Name: Horsley & Witten Report #: 366953

Sampling Point: HW-301 PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	07/15/16 06:55	07/16/16 03:41	3487567
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	**2.0**	ng/L	07/15/16 06:55	07/16/16 03:41	3487567
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	**38**	ng/L	07/15/16 06:55	07/16/16 03:41	3487567
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	< 2.0	ng/L	07/15/16 06:55	07/16/16 03:41	3487567
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	**11**	ng/L	07/15/16 06:55	07/16/16 03:41	3487567
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	**3.7**	ng/L	07/15/16 06:55	07/16/16 03:41	3487567

Sampling Point: Water Blank PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	07/15/16 06:55	07/16/16 06:15	3487569
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	< 1.0	ng/L	07/15/16 06:55	07/16/16 06:15	3487569
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	< 3.0	ng/L	07/15/16 06:55	07/16/16 06:15	3487569
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	< 2.0	ng/L	07/15/16 06:55	07/16/16 06:15	3487569
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	< 4.0	ng/L	07/15/16 06:55	07/16/16 06:15	3487569
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	< 2.0	ng/L	07/15/16 06:55	07/16/16 06:15	3487569

Sampling Point: FEB PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	07/15/16 06:55	07/16/16 06:46	3487570
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	< 1.0	ng/L	07/15/16 06:55	07/16/16 06:46	3487570
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	**3.1**	ng/L	07/15/16 06:55	07/16/16 06:46	3487570
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	< 2.0	ng/L	07/15/16 06:55	07/16/16 06:46	3487570
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	< 4.0	ng/L	07/15/16 06:55	07/16/16 06:46	3487570
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	< 2.0	ng/L	07/15/16 06:55	07/16/16 06:46	3487570

Client Name: Horsley & Witten Report #: 366953

Sampling Point: OW-9D PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	07/15/16 06:55	07/16/16 04:12	3487571
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	**2.8**	ng/L	07/15/16 06:55	07/16/16 04:12	3487571
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	**12**	ng/L	07/15/16 06:55	07/16/16 04:12	3487571
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	**3.6**	ng/L	07/15/16 06:55	07/16/16 04:12	3487571
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	**41**	ng/L	07/15/16 06:55	07/16/16 04:12	3487571
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	**5.2**	ng/L	07/15/16 06:55	07/16/16 04:12	3487571

Sampling Point: OW-9S PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	07/15/16 06:55	07/16/16 04:43	3487572
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	**14**	ng/L	07/15/16 06:55	07/16/16 04:43	3487572
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	< 3.0	ng/L	07/15/16 06:55	07/16/16 04:43	3487572
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	**7.7**	ng/L	07/15/16 06:55	07/16/16 04:43	3487572
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	**7.4**	ng/L	07/15/16 06:55	07/16/16 04:43	3487572
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	**7.0**	ng/L	07/15/16 06:55	07/16/16 04:43	3487572

Sampling Point: OW-18S PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	07/15/16 06:55	07/16/16 05:13	3487573
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	**7.1**	ng/L	07/15/16 06:55	07/16/16 05:13	3487573
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	**6.8**	ng/L	07/15/16 06:55	07/16/16 05:13	3487573
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	< 2.0	ng/L	07/15/16 06:55	07/16/16 05:13	3487573
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	**8.3**	ng/L	07/15/16 06:55	07/16/16 05:13	3487573
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	**18**	ng/L	07/15/16 06:55	07/16/16 05:13	3487573

Client Name: Horsley & Witten Report #: 366953

Sampling Point: OW-18M PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	07/15/16 06:55	07/16/16 08:35	3487574
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	**2.9**	ng/L	07/15/16 06:55	07/16/16 08:35	3487574
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	**16**	ng/L	07/15/16 06:55	07/16/16 08:35	3487574
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	**7.6**	ng/L	07/15/16 06:55	07/16/16 08:35	3487574
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	**44**	ng/L	07/15/16 06:55	07/16/16 08:35	3487574
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	**5.8**	ng/L	07/15/16 06:55	07/16/16 08:35	3487574

Sampling Point: OW-18D PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	07/15/16 06:55	07/16/16 09:05	3487575
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	**7.1**	ng/L	07/15/16 06:55	07/16/16 09:05	3487575
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	**10**	ng/L	07/15/16 06:55	07/16/16 09:05	3487575
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	**6.5**	ng/L	07/15/16 06:55	07/16/16 09:05	3487575
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	**18**	ng/L	07/15/16 06:55	07/16/16 09:05	3487575
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	**5.9**	ng/L	07/15/16 06:55	07/16/16 09:05	3487575

Sampling Point: OW-18D Dup PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	07/15/16 06:55	07/16/16 09:36	3487577
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	**6.3**	ng/L	07/15/16 06:55	07/16/16 09:36	3487577
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	**11**	ng/L	07/15/16 06:55	07/16/16 09:36	3487577
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	**5.8**	ng/L	07/15/16 06:55	07/16/16 09:36	3487577
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	**19**	ng/L	07/15/16 06:55	07/16/16 09:36	3487577
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	**5.9**	ng/L	07/15/16 06:55	07/16/16 09:36	3487577

† EEA has demonstrated it can achieve these report limits in reagent water, but can not document them in all sample matrices.

Reg Limit Type:	MCL	SMCL	AL
Symbol:	*	^	!

Lab Definitions

Continuing Calibration Check Standard (CCC) / Continuing Calibration Verification (CCV) / Initial Calibration Verification Standard (ICV) / Initial Performance Check (IPC) - is a standard containing one or more of the target analytes that is prepared from the same standards used to calibrate the instrument. This standard is used to verify the calibration curve at the beginning of each analytical sequence, and may also be analyzed throughout and at the end of the sequence. The concentration of continuing standards may be varied, when prescribed by the reference method, so that the range of the calibration curve is verified on a regular basis. CCL, CCM, and CCH are the CCC standards at low, mid, and high concentration levels, respectively.

Internal Standards (IS) - are pure compounds with properties similar to the analytes of interest, which are added to field samples or extracts, calibration standards, and quality control standards at a known concentration. They are used to measure the relative responses of the analytes of interest and surrogates in the sample, calibration standard or quality control standard.

Laboratory Duplicate (LD) - is a field sample aliquot taken from the same sample container in the laboratory and analyzed separately using identical procedures. Analysis of laboratory duplicates provides a measure of the precision of the laboratory procedures.

Laboratory Fortified Blank (LFB) / Laboratory Control Sample (LCS) - is an aliquot of reagent water to which known concentrations of the analytes of interest are added. The LFB is analyzed exactly the same as the field samples. LFBs are used to determine whether the method is in control. FBL, FBM, and FBH are the LFB samples at low, mid, and high concentration levels, respectively.

Laboratory Method Blank (LMB) / Laboratory Reagent Blank (LRB) - is a sample of reagent water included in the sample batch analyzed in the same way as the associated field samples. The LMB is used to determine if method analytes or other background contamination have been introduced during the preparation or analytical procedure. The LMB is analyzed exactly the same as the field samples.

Laboratory Trip Blank (LTB) / Field Reagent Blank (FRB) - is a sample of laboratory reagent water placed in a sample container in the laboratory and treated as a field sample, including storage, preservation, and all analytical procedures. The FRB/LTB container follows the collection bottles to and from the collection site, but the FRB/LTB is not opened at any time during the trip. The FRB/LTB is primarily a travel blank used to verify that the samples were not contaminated during shipment.

Matrix Spike Duplicate Sample (MSD) / Laboratory Fortified Sample Matrix Duplicate (LFSMD) - is a sample al6iquot taken from the same field sample source as the Matrix Spike Sample to which known quantities of the analytes of interest are added in the laboratory. The MSD is analyzed exactly the same as the field samples. Analysis of the MSD provides a measure of the precision of the laboratory procedures in a specific matrix. SDL, SDM, and SDH / LFSMDL, LFSMDM, and LFSMDH are the MSD or LFSMD at low, mid, and high concentration levels, respectively.

Matrix Spike Sample (MS) / Laboratory Fortified Sample Matrix (LFSM) - is a sample aliquot taken from field sample source to which known quantities of the analytes of interest are added in the laboratory. The MS is analyzed exactly the same as the field samples. The purpose is to demonstrate recovery of the analytes from a sample matrix to determine if the specific matrix contributes bias to the analytical results. MSL, MSM, and MSH / LFSML, LFSMM, and LFSMH are the MS or LFSM at low, mid, and high concentration levels, respectively.

Quality Control Standard (QCS) / Second Source Calibration Verification (SSCV) - is a solution containing known concentrations of the analytes of interest prepared from a source different from the source of the calibration standards. The solution is obtained from a second manufacturer or lot if the lot can be demonstrated by the manufacturer as prepared independently from other lots. The QCS sample is analyzed using the same procedures as field samples. The QCS is used as a check on the calibration standards used in the method on a routine basis.

Reporting Limit Check (RLC) / Initial Calibration Check Standard (ICCS) - is a procedural standard that is analyzed each day to evaluate instrument performance at or below the minimum reporting limit (MRL).

Surrogate Standard (SS) / Surrogate Analyte (SUR) - is a pure compound with properties similar to the analytes of interest, which is highly unlikely to be found in any field sample, that is added to the field samples, calibration standards, blanks and quality control standards before sample preparation. The SS is used to evaluate the efficiency of the sample preparation process.

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110 S. Hill Street
South Bend, IN 46617
T: 1.800.332.4345
F: 1.574.233.8207

Order # 299961
Batch # 346953

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CHAIN OF CUSTODY RECORD

Shaded area for EEA use only

REPORT TO: GARY HALDMAN 508-833-6600

SAMPLER (Signature): JSCM

PWS ID #: —

STATE (sample origin): MA

PROJECT NAME: 14105

PO#: —

BILL TO: HORSLEY WITTEN GROUP
90 RT 6A
SANDWICH MA 02563

COMPLIANCE MONITORING: Yes [ ] No [X]

POPULATION SERVED: —

SOURCE WATER: GW

LAB Number	COLLECTION DATE	TIME	AM	PM	SAMPLING SITE	TEST NAME	SAMPLE REMARKS	CHLORINATED YES	CHLORINATED NO	# OF CONTAINERS	MATRIX CODE	TURNAROUND TIME
1 3487561	7/1/16	0850	X		HW-1	PFC6/537	Absent		X	2	GW	SW
2 562	7/1/16	0935	X		HW-5	PFC6/537			X	2	GW	SW
3 563	7/1/16	1015	X		HW-302	PFC6/537			X	2	GW	SW
4 564	7/1/16	1040	X		HW-2	PFC6/537			X	2	GW	SW
5 565	7/1/16	1110	X		HW-3	PFC6/537			X	2	GW	SW
6 566	7/1/16	1220	X	X	HW-300	PFC6/537			X	2	GW	SW
7 567	7/1/16	1245	X	X	HW-301	PFC6/537			X	2	GW	SW
8 568	7/1/16	1350		X	FIELD DUP BLANK	PFC6/537			X	1		SW
9 569	7/1/16	1355		X	WATER BLANK	PFC6/537		X	X	2	GW	SW
10 570	7/1/16	1400		X	EQUIPMENT BLANK	PFC6/537		X		2	GW	SW
11 571	7/5/16	1250		X	DW-9D	PFC6/537			X	2	GW	SW
12 572	7/5/16	1315		X	DW-9S	PFC6/537			X	2	GW	SW
13 573	7/5/16	1510		X	DW-18S	PFC6/537			X	2	GW	SW
14 574	7/5/16	1550		X	DW-18M	PFC6/537	RD 7/7/16		X	2	GW	SW

Cross Offs on COC by Client

RELINQUISHED BY:(Signature)	DATE	TIME	RECEIVED BY:(Signature)	DATE	TIME
	7/1/16	1400 AM PM			AM PM
RELINQUISHED BY:(Signature)	DATE	TIME	RECEIVED BY:(Signature)	DATE	TIME
		AM PM			AM PM
RELINQUISHED BY:(Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY:	DATE	TIME
		AM PM	Rhonda Day	7/7/16	0845 AM PM

LAB RESERVES THE RIGHT TO RETURN UNUSED PORTIONS OF NON-AQUEOUS SAMPLES TO CLIENT

LAB COMMENTS: ONLY RUN WATER BLANK IF EQUIPMENT BLANK IS POSITIVE

CONDITIONS UPON RECEIPT (check one): ✓ Iced: Wet/Blue ___ Ambient 0.2 °C Upon Receipt ___ N/A

MATRIX CODES:
DW-DRINKING WATER
RW-REAGENT WATER
GW-GROUND WATER
EW-EXPOSURE WATER
SW-SURFACE WATER
PW-POOL WATER
WW-WASTE WATER

TURN-AROUND TIME (TAT) - SURCHARGES

SW = Standard Written: (15 working days)	0%	IV* = Immediate Verbal: (3 working days)	100%
RV* = Rush Verbal: (5 working days)	50%	IW* = Immediate Written: (3 working days)	125%
RW* = Rush Written: (5 working days)	75%	SP* = Weekend, Holiday	CALL
		STAT* = Less than 48 hours	CALL

* Please call, expedited service not available for all testing

Samples received unannounced with less than 48 hours holding time remaining may be subject to additional charges.

Sample analysis will be provided according to the standard EEA/Water Services Terms, which are available upon request. Any other terms proposed by Customer are deemed material alterations and are rejected unless expressly agree to in writing by EEA.

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South Bend, IN 46617
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Order # 2999101

Batch # _____

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CHAIN OF CUSTODY RECORD

Page 2 of 2

REPORT TO: GARY HERMAN 508-833-6600

SAMPLER (Signature): JBEAM

BILL TO: HORSLEY WITTEN GROUP
90 RT 6A
SANDWICH MA 02563

COMPLIANCE MONITORING: Yes ___ No X

PWS ID # —

STATE (sample origin): MA

POPULATION SERVED —

SOURCE WATER: GW

PROJECT NAME: 14105

PO#: —

	LAB Number	COLLECTION DATE	TIME	AM	PM	SAMPLING SITE	TEST NAME	SAMPLE REMARKS	CHLORINATED YES	CHLORINATED NO	# OF CONTAINERS	MATRIX CODE	TURNAROUND TIME
1	3487515	7/5/16	1655		X	OW-18 D	PFC6/537	Cl- Absent		X	2	GW	SW
2	3487517	7/5/16	1655		X	OW-18 D DUP	PFC6/537	↓ RD 7/6/16		X	2	GW	SW
3	~~3487516~~	~~7/5/16~~	~~1755~~			~~FIELD BLANK~~	~~PFC6/537~~			X	1		SW
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													

Cross Offs on COC by Client

OV

RELINQUISHED BY:(Signature)	DATE	TIME	RECEIVED BY:(Signature)	DATE	TIME
	7/5/16	1900 AM PM			AM PM
RELINQUISHED BY:(Signature)	DATE	TIME	RECEIVED BY:(Signature)	DATE	TIME
		AM PM			AM PM
RELINQUISHED BY:(Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY: Rhonda Day	DATE 7/7/16	TIME 0845 AM PM

LAB RESERVES THE RIGHT TO RETURN UNUSED PORTIONS OF NON-AQUEOUS SAMPLES TO CLIENT

LAB COMMENTS: ONLY RUN WATER BLANK IF EQUIPMENT BLANK IS POSITIVE

CONDITIONS UPON RECEIPT (check one): ✓ Iced: Wet/Blue ___ Ambient 0.2 °C Upon Receipt___ N/A

MATRIX CODES:

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RW-REAGENT WATER
GW-GROUND WATER
EW-EXPOSURE WATER
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PW-POOL WATER
WW-WASTE WATER

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RW* = Rush Written: (5 working days)	75%	SP* = Weekend, Holiday	CALL
		STAT* = Less than 48 hours	CALL

* Please call, expedited service not available for all testing

Samples received unannounced with less than 48 hours holding time remaining may be subject to additional charges.

Sample analysis will be provided according to the standard EEA/Water Services Terms, which are available upon request. Any other terms proposed by Customer are deemed material alterations and are rejected unless expressly agree to in writing by EEA.

Eurofins Eaton Analytical
Run Log

Run ID: **218082** Method: **537**

Type	Sample Id	Sample Site	Matrix	Instrument ID	Analysis Date	Calibration File
CCL	3493845		OS	CY	07/15/2016 22:34	071516M537a
LRB	3494097		RW	CY	07/15/2016 23:35	071516M537a
FBL	3494098		RW	CY	07/16/2016 00:06	071516M537a
FS	3487561	HW-1	GW	CY	07/16/2016 00:37	071516M537a
FS	3487562	HW-5	GW	CY	07/16/2016 01:07	071516M537a
FS	3487563	HW-302	GW	CY	07/16/2016 01:38	071516M537a
FS	3487564	HW-2	GW	CY	07/16/2016 02:09	071516M537a
FS	3487565	HW-3	GW	CY	07/16/2016 02:40	071516M537a
FS	3487566	HW-300	GW	CY	07/16/2016 03:10	071516M537a
FS	3487567	HW-301	GW	CY	07/16/2016 03:41	071516M537a
FS	3487571	OW-9D	GW	CY	07/16/2016 04:12	071516M537a
FS	3487572	OW-9S	GW	CY	07/16/2016 04:43	071516M537a
FS	3487573	OW-18S	GW	CY	07/16/2016 05:13	071516M537a
FTB	3487568	FTB	RW	CY	07/16/2016 05:44	071516M537a
LTB	3487569	Water Blank	RW	CY	07/16/2016 06:15	071516M537a
FEB	3487570	FEB	RW	CY	07/16/2016 06:46	071516M537a
CCM	3493846		OS	CY	07/16/2016 08:04	071516M537a
FS	3487574	OW-18M	GW	CY	07/16/2016 08:35	071516M537a
FS	3487575	OW-18D	GW	CY	07/16/2016 09:05	071516M537a
FD	3487577	OW-18D Dup	GW	CY	07/16/2016 09:36	071516M537a
CCH	3493847		OS	CY	07/16/2016 15:14	071516M537a

QC Summary Report

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
CCL	IS-PFOA-13C2	537	N/A	---		5612.39	5612.39	ng/L	100	50 - 150	---	---	1.0	07/14/2016 14:02	07/15/2016 22:34	3493845
CCL	IS-PFOS-13C4	537	N/A	---		3148.93	3148.93	ng/L	100	50 - 150	---	---	1.0	07/14/2016 14:02	07/15/2016 22:34	3493845
CCL	SS-PFDA-13C2	537	N/A	---		98.9276	100	ng/L	99	70 - 130	---	---	1.0	07/14/2016 14:02	07/15/2016 22:34	3493845
CCL	SS-PFHxA-13C2	537	N/A	---		52.0950	50.0	ng/L	104	70 - 130	---	---	1.0	07/14/2016 14:02	07/15/2016 22:34	3493845
CCL	Perfluorobutanesulfonic acid (PFBS)	537	9.0	---		8.7656	9.0	ng/L	97	50 - 150	---	---	1.0	07/14/2016 14:02	07/15/2016 22:34	3493845
CCL	Perfluoroheptanoic acid (PFHpA)	537	1.0	---		0.9028	1.0	ng/L	90	50 - 150	---	---	1.0	07/14/2016 14:02	07/15/2016 22:34	3493845
CCL	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	---		2.5405	3.0	ng/L	85	50 - 150	---	---	1.0	07/14/2016 14:02	07/15/2016 22:34	3493845
CCL	Perfluorononanoic acid (PFNA)	537	2.0	---		2.0777	2.0	ng/L	104	50 - 150	---	---	1.0	07/14/2016 14:02	07/15/2016 22:34	3493845
CCL	Perfluorooctane sulfonate (PFOS)	537	4.0	---		3.5318	4.0	ng/L	88	50 - 150	---	---	1.0	07/14/2016 14:02	07/15/2016 22:34	3493845
CCL	Perfluorooctanoic acid (PFOA)	537	2.0	---		1.8475	2.0	ng/L	92	50 - 150	---	---	1.0	07/14/2016 14:02	07/15/2016 22:34	3493845
LRB	IS-PFOA-13C2	537	N/A	---		6183.95	5612.39	ng/L	110	50 - 150	---	---	0.96	07/15/2016 06:55	07/15/2016 23:35	3494097
LRB	IS-PFOS-13C4	537	N/A	---		3347.64	3148.93	ng/L	106	50 - 150	---	---	0.96	07/15/2016 06:55	07/15/2016 23:35	3494097
LRB	SS-PFDA-13C2	537	N/A	---		90.5954	100	ng/L	94	70 - 130	---	---	0.96	07/15/2016 06:55	07/15/2016 23:35	3494097
LRB	SS-PFHxA-13C2	537	N/A	---		46.3438	50.0	ng/L	97	70 - 130	---	---	0.96	07/15/2016 06:55	07/15/2016 23:35	3494097
LRB	Perfluorobutanesulfonic acid (PFBS)	537	9.0	---	<	9.0		ng/L	---	---	---	---	0.96	07/15/2016 06:55	07/15/2016 23:35	3494097
LRB	Perfluoroheptanoic acid (PFHpA)	537	1.0	---	<	1.0		ng/L	---	---	---	---	0.96	07/15/2016 06:55	07/15/2016 23:35	3494097
LRB	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	---	<	3.0		ng/L	---	---	---	---	0.96	07/15/2016 06:55	07/15/2016 23:35	3494097
LRB	Perfluorononanoic acid (PFNA)	537	2.0	---	<	2.0		ng/L	---	---	---	---	0.96	07/15/2016 06:55	07/15/2016 23:35	3494097
LRB	Perfluorooctane sulfonate (PFOS)	537	4.0	---	<	4.0		ng/L	---	---	---	---	0.96	07/15/2016 06:55	07/15/2016 23:35	3494097
LRB	Perfluorooctanoic acid (PFOA)	537	2.0	---	<	2.0		ng/L	---	---	---	---	0.96	07/15/2016 06:55	07/15/2016 23:35	3494097
FBL	IS-PFOA-13C2	537	N/A	---		6109.56	5612.39	ng/L	109	50 - 150	---	---	1.0	07/15/2016 06:55	07/16/2016 00:06	3494098
FBL	IS-PFOS-13C4	537	N/A	---		3340.52	3148.93	ng/L	106	50 - 150	---	---	1.0	07/15/2016 06:55	07/16/2016 00:06	3494098
FBL	SS-PFDA-13C2	537	N/A	---		101.9680	100	ng/L	102	70 - 130	---	---	1.0	07/15/2016 06:55	07/16/2016 00:06	3494098
FBL	SS-PFHxA-13C2	537	N/A	---		50.0994	50.0	ng/L	100	70 - 130	---	---	1.0	07/15/2016 06:55	07/16/2016 00:06	3494098
FBL	Perfluorobutanesulfonic acid (PFBS)	537	9.0	---		8.6322	9.0	ng/L	96	50 - 150	---	---	1.0	07/15/2016 06:55	07/16/2016 00:06	3494098
FBL	Perfluoroheptanoic acid (PFHpA)	537	1.0	---		0.8766	1.0	ng/L	88	50 - 150	---	---	1.0	07/15/2016 06:55	07/16/2016 00:06	3494098
FBL	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	---		2.4658	3.0	ng/L	82	50 - 150	---	---	1.0	07/15/2016 06:55	07/16/2016 00:06	3494098
FBL	Perfluorononanoic acid (PFNA)	537	2.0	---		1.7970	2.0	ng/L	90	50 - 150	---	---	1.0	07/15/2016 06:55	07/16/2016 00:06	3494098
FBL	Perfluorooctane sulfonate (PFOS)	537	4.0	---		3.5228	4.0	ng/L	88	50 - 150	---	---	1.0	07/15/2016 06:55	07/16/2016 00:06	3494098
FBL	Perfluorooctanoic acid (PFOA)	537	2.0	---		1.9094	2.0	ng/L	95	50 - 150	---	---	1.0	07/15/2016 06:55	07/16/2016 00:06	3494098
FS	IS-PFOA-13C2	537	N/A	HW-1		6018.82	5612.39	ng/L	107	50 - 150	---	---	0.93	07/15/2016 06:55	07/16/2016 00:37	3487561
FS	IS-PFOS-13C4	537	N/A	HW-1		3296.60	3148.93	ng/L	105	50 - 150	---	---	0.93	07/15/2016 06:55	07/16/2016 00:37	3487561
FS	SS-PFDA-13C2	537	N/A	HW-1		93.9715	100	ng/L	101	70 - 130	---	---	0.93	07/15/2016 06:55	07/16/2016 00:37	3487561
FS	SS-PFHxA-13C2	537	N/A	HW-1		46.5150	50.0	ng/L	100	70 - 130	---	---	0.93	07/15/2016 06:55	07/16/2016 00:37	3487561
FS	Perfluorobutanesulfonic acid (PFBS)	537	9.0	HW-1	<	9.0		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 00:37	3487561
FS	Perfluoroheptanoic acid (PFHpA)	537	1.0	HW-1		10		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 00:37	3487561
FS	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	HW-1		18		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 00:37	3487561
FS	Perfluorononanoic acid (PFNA)	537	2.0	HW-1	<	2.0		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 00:37	3487561
FS	Perfluorooctane sulfonate (PFOS)	537	4.0	HW-1		17		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 00:37	3487561
FS	Perfluorooctanoic acid (PFOA)	537	2.0	HW-1		33		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 00:37	3487561

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
FS	IS-PFOA-13C2	537	N/A	HW-5		6138.87	5612.39	ng/L	109	50 - 150	---	---	0.96	07/15/2016 06:55	07/16/2016 01:07	3487562
FS	IS-PFOS-13C4	537	N/A	HW-5		3240.44	3148.93	ng/L	103	50 - 150	---	---	0.96	07/15/2016 06:55	07/16/2016 01:07	3487562
FS	SS-PFDA-13C2	537	N/A	HW-5		96.6001	100	ng/L	101	70 - 130	---	---	0.96	07/15/2016 06:55	07/16/2016 01:07	3487562
FS	SS-PFHxA-13C2	537	N/A	HW-5		42.1262	50.0	ng/L	88	70 - 130	---	---	0.96	07/15/2016 06:55	07/16/2016 01:07	3487562
FS	Perfluorobutanesulfonic acid (PFBS)	537	9.0	HW-5	<	9.0		ng/L	---	---	---	---	0.96	07/15/2016 06:55	07/16/2016 01:07	3487562
FS	Perfluoroheptanoic acid (PFHpA)	537	1.0	HW-5		4.1		ng/L	---	---	---	---	0.96	07/15/2016 06:55	07/16/2016 01:07	3487562
FS	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	HW-5		11		ng/L	---	---	---	---	0.96	07/15/2016 06:55	07/16/2016 01:07	3487562
FS	Perfluorononanoic acid (PFNA)	537	2.0	HW-5	<	2.0		ng/L	---	---	---	---	0.96	07/15/2016 06:55	07/16/2016 01:07	3487562
FS	Perfluorooctane sulfonate (PFOS)	537	4.0	HW-5		120		ng/L	---	---	---	---	0.96	07/15/2016 06:55	07/16/2016 01:07	3487562
FS	Perfluorooctanoic acid (PFOA)	537	2.0	HW-5		31		ng/L	---	---	---	---	0.96	07/15/2016 06:55	07/16/2016 01:07	3487562
FS	IS-PFOA-13C2	537	N/A	HW-302		6125.55	5612.39	ng/L	109	50 - 150	---	---	0.9	07/15/2016 06:55	07/16/2016 01:38	3487563
FS	IS-PFOS-13C4	537	N/A	HW-302		3366.13	3148.93	ng/L	107	50 - 150	---	---	0.9	07/15/2016 06:55	07/16/2016 01:38	3487563
FS	SS-PFDA-13C2	537	N/A	HW-302		89.5602	100	ng/L	100	70 - 130	---	---	0.9	07/15/2016 06:55	07/16/2016 01:38	3487563
FS	SS-PFHxA-13C2	537	N/A	HW-302		43.1709	50.0	ng/L	96	70 - 130	---	---	0.9	07/15/2016 06:55	07/16/2016 01:38	3487563
FS	Perfluorobutanesulfonic acid (PFBS)	537	9.0	HW-302	<	9.0		ng/L	---	---	---	---	0.9	07/15/2016 06:55	07/16/2016 01:38	3487563
FS	Perfluoroheptanoic acid (PFHpA)	537	1.0	HW-302		19		ng/L	---	---	---	---	0.9	07/15/2016 06:55	07/16/2016 01:38	3487563
FS	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	HW-302		6.3		ng/L	---	---	---	---	0.9	07/15/2016 06:55	07/16/2016 01:38	3487563
FS	Perfluorononanoic acid (PFNA)	537	2.0	HW-302		54		ng/L	---	---	---	---	0.9	07/15/2016 06:55	07/16/2016 01:38	3487563
FS	Perfluorooctane sulfonate (PFOS)	537	4.0	HW-302		14		ng/L	---	---	---	---	0.9	07/15/2016 06:55	07/16/2016 01:38	3487563
FS	Perfluorooctanoic acid (PFOA)	537	2.0	HW-302		33		ng/L	---	---	---	---	0.9	07/15/2016 06:55	07/16/2016 01:38	3487563
FS	IS-PFOA-13C2	537	N/A	HW-2		5929.00	5612.39	ng/L	106	50 - 150	---	---	0.9	07/15/2016 06:55	07/16/2016 02:09	3487564
FS	IS-PFOS-13C4	537	N/A	HW-2		3217.75	3148.93	ng/L	102	50 - 150	---	---	0.9	07/15/2016 06:55	07/16/2016 02:09	3487564
FS	SS-PFDA-13C2	537	N/A	HW-2		88.6144	100	ng/L	98	70 - 130	---	---	0.9	07/15/2016 06:55	07/16/2016 02:09	3487564
FS	SS-PFHxA-13C2	537	N/A	HW-2		44.0376	50.0	ng/L	98	70 - 130	---	---	0.9	07/15/2016 06:55	07/16/2016 02:09	3487564
FS	Perfluorobutanesulfonic acid (PFBS)	537	9.0	HW-2	<	9.0		ng/L	---	---	---	---	0.9	07/15/2016 06:55	07/16/2016 02:09	3487564
FS	Perfluoroheptanoic acid (PFHpA)	537	1.0	HW-2		7.1		ng/L	---	---	---	---	0.9	07/15/2016 06:55	07/16/2016 02:09	3487564
FS	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	HW-2		3.5		ng/L	---	---	---	---	0.9	07/15/2016 06:55	07/16/2016 02:09	3487564
FS	Perfluorononanoic acid (PFNA)	537	2.0	HW-2	<	2.0		ng/L	---	---	---	---	0.9	07/15/2016 06:55	07/16/2016 02:09	3487564
FS	Perfluorooctane sulfonate (PFOS)	537	4.0	HW-2		12		ng/L	---	---	---	---	0.9	07/15/2016 06:55	07/16/2016 02:09	3487564
FS	Perfluorooctanoic acid (PFOA)	537	2.0	HW-2		6.3		ng/L	---	---	---	---	0.9	07/15/2016 06:55	07/16/2016 02:09	3487564
FS	IS-PFOA-13C2	537	N/A	HW-3		5634.78	5612.39	ng/L	100	50 - 150	---	---	0.95	07/15/2016 06:55	07/16/2016 02:40	3487565
FS	IS-PFOS-13C4	537	N/A	HW-3		3087.76	3148.93	ng/L	98	50 - 150	---	---	0.95	07/15/2016 06:55	07/16/2016 02:40	3487565
FS	SS-PFDA-13C2	537	N/A	HW-3		94.6694	100	ng/L	100	70 - 130	---	---	0.95	07/15/2016 06:55	07/16/2016 02:40	3487565
FS	SS-PFHxA-13C2	537	N/A	HW-3		47.8553	50.0	ng/L	101	70 - 130	---	---	0.95	07/15/2016 06:55	07/16/2016 02:40	3487565
FS	Perfluorobutanesulfonic acid (PFBS)	537	9.0	HW-3	<	9.0		ng/L	---	---	---	---	0.95	07/15/2016 06:55	07/16/2016 02:40	3487565
FS	Perfluoroheptanoic acid (PFHpA)	537	1.0	HW-3		16		ng/L	---	---	---	---	0.95	07/15/2016 06:55	07/16/2016 02:40	3487565
FS	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	HW-3		4.3		ng/L	---	---	---	---	0.95	07/15/2016 06:55	07/16/2016 02:40	3487565
FS	Perfluorononanoic acid (PFNA)	537	2.0	HW-3		6.3		ng/L	---	---	---	---	0.95	07/15/2016 06:55	07/16/2016 02:40	3487565
FS	Perfluorooctane sulfonate (PFOS)	537	4.0	HW-3		84		ng/L	---	---	---	---	0.95	07/15/2016 06:55	07/16/2016 02:40	3487565
FS	Perfluorooctanoic acid (PFOA)	537	2.0	HW-3		9.1		ng/L	---	---	---	---	0.95	07/15/2016 06:55	07/16/2016 02:40	3487565
FS	IS-PFOA-13C2	537	N/A	HW-300		5759.53	5612.39	ng/L	103	50 - 150	---	---	0.91	07/15/2016 06:55	07/16/2016 03:10	3487566

QC Summary Report (cont.)																
Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
FS	IS-PFOS-13C4	537	N/A	HW-300		3229.15	3148.93	ng/L	103	50 - 150	---	---	0.91	07/15/2016 06:55	07/16/2016 03:10	3487566
FS	SS-PFDA-13C2	537	N/A	HW-300		89.9253	100	ng/L	99	70 - 130	---	---	0.91	07/15/2016 06:55	07/16/2016 03:10	3487566
FS	SS-PFHxA-13C2	537	N/A	HW-300		44.6874	50.0	ng/L	98	70 - 130	---	---	0.91	07/15/2016 06:55	07/16/2016 03:10	3487566
FS	Perfluorobutanesulfonic acid (PFBS)	537	9.0	HW-300	<	9.0		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 03:10	3487566
FS	Perfluoroheptanoic acid (PFHpA)	537	1.0	HW-300		9.6		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 03:10	3487566
FS	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	HW-300		12		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 03:10	3487566
FS	Perfluorononanoic acid (PFNA)	537	2.0	HW-300	<	2.0		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 03:10	3487566
FS	Perfluorooctane sulfonate (PFOS)	537	4.0	HW-300		17		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 03:10	3487566
FS	Perfluorooctanoic acid (PFOA)	537	2.0	HW-300		5.2		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 03:10	3487566
FS	IS-PFOA-13C2	537	N/A	HW-301		5944.34	5612.39	ng/L	106	50 - 150	---	---	0.92	07/15/2016 06:55	07/16/2016 03:41	3487567
FS	IS-PFOS-13C4	537	N/A	HW-301		3297.04	3148.93	ng/L	105	50 - 150	---	---	0.92	07/15/2016 06:55	07/16/2016 03:41	3487567
FS	SS-PFDA-13C2	537	N/A	HW-301		89.4724	100	ng/L	97	70 - 130	---	---	0.92	07/15/2016 06:55	07/16/2016 03:41	3487567
FS	SS-PFHxA-13C2	537	N/A	HW-301		44.7715	50.0	ng/L	97	70 - 130	---	---	0.92	07/15/2016 06:55	07/16/2016 03:41	3487567
FS	Perfluorobutanesulfonic acid (PFBS)	537	9.0	HW-301	<	9.0		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 03:41	3487567
FS	Perfluoroheptanoic acid (PFHpA)	537	1.0	HW-301		2.0		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 03:41	3487567
FS	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	HW-301		38		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 03:41	3487567
FS	Perfluorononanoic acid (PFNA)	537	2.0	HW-301	<	2.0		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 03:41	3487567
FS	Perfluorooctane sulfonate (PFOS)	537	4.0	HW-301		11		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 03:41	3487567
FS	Perfluorooctanoic acid (PFOA)	537	2.0	HW-301		3.7		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 03:41	3487567
FS	IS-PFOA-13C2	537	N/A	OW-9D		6318.18	5612.39	ng/L	113	50 - 150	---	---	0.92	07/15/2016 06:55	07/16/2016 04:12	3487571
FS	IS-PFOS-13C4	537	N/A	OW-9D		3199.29	3148.93	ng/L	102	50 - 150	---	---	0.92	07/15/2016 06:55	07/16/2016 04:12	3487571
FS	SS-PFDA-13C2	537	N/A	OW-9D		88.3353	100	ng/L	96	70 - 130	---	---	0.92	07/15/2016 06:55	07/16/2016 04:12	3487571
FS	SS-PFHxA-13C2	537	N/A	OW-9D		42.8460	50.0	ng/L	93	70 - 130	---	---	0.92	07/15/2016 06:55	07/16/2016 04:12	3487571
FS	Perfluorobutanesulfonic acid (PFBS)	537	9.0	OW-9D	<	9.0		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 04:12	3487571
FS	Perfluoroheptanoic acid (PFHpA)	537	1.0	OW-9D		2.8		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 04:12	3487571
FS	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	OW-9D		12		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 04:12	3487571
FS	Perfluorononanoic acid (PFNA)	537	2.0	OW-9D		3.6		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 04:12	3487571
FS	Perfluorooctane sulfonate (PFOS)	537	4.0	OW-9D		41		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 04:12	3487571
FS	Perfluorooctanoic acid (PFOA)	537	2.0	OW-9D		5.2		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 04:12	3487571
FS	IS-PFOA-13C2	537	N/A	OW-9S		6166.39	5612.39	ng/L	110	50 - 150	---	---	0.93	07/15/2016 06:55	07/16/2016 04:43	3487572
FS	IS-PFOS-13C4	537	N/A	OW-9S		3287.80	3148.93	ng/L	104	50 - 150	---	---	0.93	07/15/2016 06:55	07/16/2016 04:43	3487572
FS	SS-PFDA-13C2	537	N/A	OW-9S		89.9806	100	ng/L	97	70 - 130	---	---	0.93	07/15/2016 06:55	07/16/2016 04:43	3487572
FS	SS-PFHxA-13C2	537	N/A	OW-9S		44.4007	50.0	ng/L	95	70 - 130	---	---	0.93	07/15/2016 06:55	07/16/2016 04:43	3487572
FS	Perfluorobutanesulfonic acid (PFBS)	537	9.0	OW-9S	<	9.0		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 04:43	3487572
FS	Perfluoroheptanoic acid (PFHpA)	537	1.0	OW-9S		14		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 04:43	3487572
FS	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	OW-9S	<	3.0		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 04:43	3487572
FS	Perfluorononanoic acid (PFNA)	537	2.0	OW-9S		7.7		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 04:43	3487572
FS	Perfluorooctane sulfonate (PFOS)	537	4.0	OW-9S		7.4		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 04:43	3487572
FS	Perfluorooctanoic acid (PFOA)	537	2.0	OW-9S		7.0		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 04:43	3487572
FS	IS-PFOA-13C2	537	N/A	OW-18S		5767.50	5612.39	ng/L	103	50 - 150	---	---	0.92	07/15/2016 06:55	07/16/2016 05:13	3487573
FS	IS-PFOS-13C4	537	N/A	OW-18S		3115.62	3148.93	ng/L	99	50 - 150	---	---	0.92	07/15/2016 06:55	07/16/2016 05:13	3487573

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
FS	SS-PFDA-13C2	537	N/A	OW-18S		84.1629	100	ng/L	91	70 - 130	---	---	0.92	07/15/2016 06:55	07/16/2016 05:13	3487573
FS	SS-PFHxA-13C2	537	N/A	OW-18S		43.4937	50.0	ng/L	95	70 - 130	---	---	0.92	07/15/2016 06:55	07/16/2016 05:13	3487573
FS	Perfluorobutanesulfonic acid (PFBS)	537	9.0	OW-18S	<	9.0		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 05:13	3487573
FS	Perfluoroheptanoic acid (PFHpA)	537	1.0	OW-18S		7.1		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 05:13	3487573
FS	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	OW-18S		6.8		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 05:13	3487573
FS	Perfluorononanoic acid (PFNA)	537	2.0	OW-18S	<	2.0		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 05:13	3487573
FS	Perfluorooctane sulfonate (PFOS)	537	4.0	OW-18S		8.3		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 05:13	3487573
FS	Perfluorooctanoic acid (PFOA)	537	2.0	OW-18S		18		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 05:13	3487573
FTB	IS-PFOA-13C2	537	N/A	FTB		6017.74	5612.39	ng/L	107	50 - 150	---	---	0.95	07/15/2016 06:55	07/16/2016 05:44	3487568
FTB	IS-PFOS-13C4	537	N/A	FTB		3253.38	3148.93	ng/L	103	50 - 150	---	---	0.95	07/15/2016 06:55	07/16/2016 05:44	3487568
FTB	SS-PFDA-13C2	537	N/A	FTB		92.2555	100	ng/L	97	70 - 130	---	---	0.95	07/15/2016 06:55	07/16/2016 05:44	3487568
FTB	SS-PFHxA-13C2	537	N/A	FTB		46.8252	50.0	ng/L	99	70 - 130	---	---	0.95	07/15/2016 06:55	07/16/2016 05:44	3487568
FTB	Perfluorobutanesulfonic acid (PFBS)	537	9.0	FTB	<	9.0		ng/L	---	---	---	---	0.95	07/15/2016 06:55	07/16/2016 05:44	3487568
FTB	Perfluoroheptanoic acid (PFHpA)	537	1.0	FTB	<	1.0		ng/L	---	---	---	---	0.95	07/15/2016 06:55	07/16/2016 05:44	3487568
FTB	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	FTB	<	3.0		ng/L	---	---	---	---	0.95	07/15/2016 06:55	07/16/2016 05:44	3487568
FTB	Perfluorononanoic acid (PFNA)	537	2.0	FTB	<	2.0		ng/L	---	---	---	---	0.95	07/15/2016 06:55	07/16/2016 05:44	3487568
FTB	Perfluorooctane sulfonate (PFOS)	537	4.0	FTB	<	4.0		ng/L	---	---	---	---	0.95	07/15/2016 06:55	07/16/2016 05:44	3487568
FTB	Perfluorooctanoic acid (PFOA)	537	2.0	FTB	<	2.0		ng/L	---	---	---	---	0.95	07/15/2016 06:55	07/16/2016 05:44	3487568
LTB	IS-PFOA-13C2	537	N/A	Water Blank		5622.09	5612.39	ng/L	100	50 - 150	---	---	0.92	07/15/2016 06:55	07/16/2016 06:15	3487569
LTB	IS-PFOS-13C4	537	N/A	Water Blank		3059.64	3148.93	ng/L	97	50 - 150	---	---	0.92	07/15/2016 06:55	07/16/2016 06:15	3487569
LTB	SS-PFDA-13C2	537	N/A	Water Blank		93.6338	100	ng/L	102	70 - 130	---	---	0.92	07/15/2016 06:55	07/16/2016 06:15	3487569
LTB	SS-PFHxA-13C2	537	N/A	Water Blank		46.7087	50.0	ng/L	102	70 - 130	---	---	0.92	07/15/2016 06:55	07/16/2016 06:15	3487569
LTB	Perfluorobutanesulfonic acid (PFBS)	537	9.0	Water Blank	<	9.0		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 06:15	3487569
LTB	Perfluoroheptanoic acid (PFHpA)	537	1.0	Water Blank	<	1.0		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 06:15	3487569
LTB	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	Water Blank	<	3.0		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 06:15	3487569
LTB	Perfluorononanoic acid (PFNA)	537	2.0	Water Blank	<	2.0		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 06:15	3487569
LTB	Perfluorooctane sulfonate (PFOS)	537	4.0	Water Blank	<	4.0		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 06:15	3487569
LTB	Perfluorooctanoic acid (PFOA)	537	2.0	Water Blank	<	2.0		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 06:15	3487569
FEB	IS-PFOA-13C2	537	N/A	FEB		5817.24	5612.39	ng/L	104	50 - 150	---	---	0.91	07/15/2016 06:55	07/16/2016 06:46	3487570
FEB	IS-PFOS-13C4	537	N/A	FEB		3164.20	3148.93	ng/L	100	50 - 150	---	---	0.91	07/15/2016 06:55	07/16/2016 06:46	3487570
FEB	SS-PFDA-13C2	537	N/A	FEB		89.0140	100	ng/L	98	70 - 130	---	---	0.91	07/15/2016 06:55	07/16/2016 06:46	3487570
FEB	SS-PFHxA-13C2	537	N/A	FEB		45.1178	50.0	ng/L	99	70 - 130	---	---	0.91	07/15/2016 06:55	07/16/2016 06:46	3487570
FEB	Perfluorobutanesulfonic acid (PFBS)	537	9.0	FEB	<	9.0		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 06:46	3487570
FEB	Perfluoroheptanoic acid (PFHpA)	537	1.0	FEB	<	1.0		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 06:46	3487570
FEB	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	FEB		3.1		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 06:46	3487570
FEB	Perfluorononanoic acid (PFNA)	537	2.0	FEB	<	2.0		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 06:46	3487570
FEB	Perfluorooctane sulfonate (PFOS)	537	4.0	FEB	<	4.0		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 06:46	3487570
FEB	Perfluorooctanoic acid (PFOA)	537	2.0	FEB	<	2.0		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 06:46	3487570
CCM	IS-PFOA-13C2	537	N/A	---		5967.13	5967.13	ng/L	100	50 - 150	---	---	1.0	07/14/2016 14:02	07/16/2016 08:04	3493846
CCM	IS-PFOS-13C4	537	N/A	---		3070.60	3070.6	ng/L	100	50 - 150	---	---	1.0	07/14/2016 14:02	07/16/2016 08:04	3493846
CCM	SS-PFDA-13C2	537	N/A	---		97.8600	100	ng/L	98	70 - 130	---	---	1.0	07/14/2016 14:02	07/16/2016 08:04	3493846

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
CCM	SS-PFHxA-13C2	537	N/A	---		50.0794	50.0	ng/L	100	70 - 130	---	---	1.0	07/14/2016 14:02	07/16/2016 08:04	3493846
CCM	Perfluorobutanesulfonic acid (PFBS)	537	9.0	---		707.1170	675	ng/L	105	70 - 130	---	---	1.0	07/14/2016 14:02	07/16/2016 08:04	3493846
CCM	Perfluoroheptanoic acid (PFHpA)	537	1.0	---		75.3643	75.0	ng/L	100	70 - 130	---	---	1.0	07/14/2016 14:02	07/16/2016 08:04	3493846
CCM	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	---		239.4340	225	ng/L	106	70 - 130	---	---	1.0	07/14/2016 14:02	07/16/2016 08:04	3493846
CCM	Perfluorononanoic acid (PFNA)	537	2.0	---		150.1410	150	ng/L	100	70 - 130	---	---	1.0	07/14/2016 14:02	07/16/2016 08:04	3493846
CCM	Perfluorooctane sulfonate (PFOS)	537	4.0	---		306.2460	300	ng/L	102	70 - 130	---	---	1.0	07/14/2016 14:02	07/16/2016 08:04	3493846
CCM	Perfluorooctanoic acid (PFOA)	537	2.0	---		152.0310	150	ng/L	101	70 - 130	---	---	1.0	07/14/2016 14:02	07/16/2016 08:04	3493846
FS	IS-PFOA-13C2	537	N/A	OW-18M		6070.39	5967.13	ng/L	102	50 - 150	---	---	0.93	07/15/2016 06:55	07/16/2016 08:35	3487574
FS	IS-PFOS-13C4	537	N/A	OW-18M		3275.67	3070.6	ng/L	107	50 - 150	---	---	0.93	07/15/2016 06:55	07/16/2016 08:35	3487574
FS	SS-PFDA-13C2	537	N/A	OW-18M		92.4157	100	ng/L	99	70 - 130	---	---	0.93	07/15/2016 06:55	07/16/2016 08:35	3487574
FS	SS-PFHxA-13C2	537	N/A	OW-18M		44.3518	50.0	ng/L	95	70 - 130	---	---	0.93	07/15/2016 06:55	07/16/2016 08:35	3487574
FS	Perfluorobutanesulfonic acid (PFBS)	537	9.0	OW-18M	<	9.0		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 08:35	3487574
FS	Perfluoroheptanoic acid (PFHpA)	537	1.0	OW-18M		2.9		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 08:35	3487574
FS	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	OW-18M		16		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 08:35	3487574
FS	Perfluorononanoic acid (PFNA)	537	2.0	OW-18M		7.6		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 08:35	3487574
FS	Perfluorooctane sulfonate (PFOS)	537	4.0	OW-18M		44		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 08:35	3487574
FS	Perfluorooctanoic acid (PFOA)	537	2.0	OW-18M		5.8		ng/L	---	---	---	---	0.93	07/15/2016 06:55	07/16/2016 08:35	3487574
FS	IS-PFOA-13C2	537	N/A	OW-18D		5744.45	5967.13	ng/L	96	50 - 150	---	---	0.91	07/15/2016 06:55	07/16/2016 09:05	3487575
FS	IS-PFOS-13C4	537	N/A	OW-18D		3156.31	3070.6	ng/L	103	50 - 150	---	---	0.91	07/15/2016 06:55	07/16/2016 09:05	3487575
FS	SS-PFDA-13C2	537	N/A	OW-18D		90.2791	100	ng/L	99	70 - 130	---	---	0.91	07/15/2016 06:55	07/16/2016 09:05	3487575
FS	SS-PFHxA-13C2	537	N/A	OW-18D		45.0096	50.0	ng/L	99	70 - 130	---	---	0.91	07/15/2016 06:55	07/16/2016 09:05	3487575
FS	Perfluorobutanesulfonic acid (PFBS)	537	9.0	OW-18D	<	9.0		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 09:05	3487575
FS	Perfluoroheptanoic acid (PFHpA)	537	1.0	OW-18D		7.1		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 09:05	3487575
FS	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	OW-18D		10		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 09:05	3487575
FS	Perfluorononanoic acid (PFNA)	537	2.0	OW-18D		6.5		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 09:05	3487575
FS	Perfluorooctane sulfonate (PFOS)	537	4.0	OW-18D		18		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 09:05	3487575
FS	Perfluorooctanoic acid (PFOA)	537	2.0	OW-18D		5.9		ng/L	---	---	---	---	0.91	07/15/2016 06:55	07/16/2016 09:05	3487575
FD	IS-PFOA-13C2	537	N/A	OW-18D Dup		6269.76	5967.13	ng/L	105	50 - 150	---	---	0.92	07/15/2016 06:55	07/16/2016 09:36	3487577
FD	IS-PFOS-13C4	537	N/A	OW-18D Dup		3125.36	3070.6	ng/L	102	50 - 150	---	---	0.92	07/15/2016 06:55	07/16/2016 09:36	3487577
FD	SS-PFDA-13C2	537	N/A	OW-18D Dup		86.7314	100	ng/L	94	70 - 130	---	---	0.92	07/15/2016 06:55	07/16/2016 09:36	3487577
FD	SS-PFHxA-13C2	537	N/A	OW-18D Dup		42.1722	50.0	ng/L	92	70 - 130	---	---	0.92	07/15/2016 06:55	07/16/2016 09:36	3487577
FD	Perfluorobutanesulfonic acid (PFBS)	537	9.0	OW-18D Dup	<	9.0		ng/L	---	---	---	---	0.92	07/15/2016 06:55	07/16/2016 09:36	3487577
FD	Perfluoroheptanoic acid (PFHpA)	537	1.0	OW-18D Dup		6.3		ng/L	---	---	13	30	0.92	07/15/2016 06:55	07/16/2016 09:36	3487577
FD	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	OW-18D Dup		11		ng/L	---	---	0.8	30	0.92	07/15/2016 06:55	07/16/2016 09:36	3487577
FD	Perfluorononanoic acid (PFNA)	537	2.0	OW-18D Dup		5.8		ng/L	---	---	12	30	0.92	07/15/2016 06:55	07/16/2016 09:36	3487577
FD	Perfluorooctane sulfonate (PFOS)	537	4.0	OW-18D Dup		19		ng/L	---	---	4.2	30	0.92	07/15/2016 06:55	07/16/2016 09:36	3487577
FD	Perfluorooctanoic acid (PFOA)	537	2.0	OW-18D Dup		5.9		ng/L	---	---	0.3	30	0.92	07/15/2016 06:55	07/16/2016 09:36	3487577
CCH	IS-PFOA-13C2	537	N/A	---		5620.40	5620.4	ng/L	100	50 - 150	---	---	1.0	07/14/2016 14:02	07/16/2016 15:14	3493847
CCH	IS-PFOS-13C4	537	N/A	---		2833.17	2833.17	ng/L	100	50 - 150	---	---	1.0	07/14/2016 14:02	07/16/2016 15:14	3493847
CCH	SS-PFDA-13C2	537	N/A	---		94.6285	100	ng/L	95	70 - 130	---	---	1.0	07/14/2016 14:02	07/16/2016 15:14	3493847
CCH	SS-PFHxA-13C2	537	N/A	---		49.9913	50.0	ng/L	100	70 - 130	---	---	1.0	07/14/2016 14:02	07/16/2016 15:14	3493847

QC Summary Report (cont.)																
Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
CCH	Perfluorobutanesulfonic acid (PFBS)	537	9.0	---		1179.9800	1125	ng/L	105	70 - 130	---	---	1.0	07/14/2016 14:02	07/16/2016 15:14	3493847
CCH	Perfluoroheptanoic acid (PFHpA)	537	1.0	---		120.5790	125	ng/L	96	70 - 130	---	---	1.0	07/14/2016 14:02	07/16/2016 15:14	3493847
CCH	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	---		384.6980	375	ng/L	103	70 - 130	---	---	1.0	07/14/2016 14:02	07/16/2016 15:14	3493847
CCH	Perfluorononanoic acid (PFNA)	537	2.0	---		235.9880	250	ng/L	94	70 - 130	---	---	1.0	07/14/2016 14:02	07/16/2016 15:14	3493847
CCH	Perfluorooctane sulfonate (PFOS)	537	4.0	---		505.9300	500	ng/L	101	70 - 130	---	---	1.0	07/14/2016 14:02	07/16/2016 15:14	3493847
CCH	Perfluorooctanoic acid (PFOA)	537	2.0	---		247.1220	250	ng/L	99	70 - 130	---	---	1.0	07/14/2016 14:02	07/16/2016 15:14	3493847

Sample Type Key

Type (Abbr.)	Sample Type	Type (Abbr.)	Sample Type
CCH	Continuing Calibration High		
CCL	Continuing Calibration Low		
CCM	Continuing Calibration Mid		
FD	Field Duplicate		
FEB	Field Equipment Blank		
FS	Field Sample		
FTB	Field Trip Blank		
FBL	Fortified Blank Low		
LRB	Laboratory Reagent Blank		
LTB	Laboratory Trip Blank		

END OF REPORT

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LABORATORY REPORT

If you have any questions concerning this report, please do not hesitate to call us at (800) 332-4345 or (574) 233-4777.

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STATE CERTIFICATION LIST

State	Certification	State	Certification
Alabama	40700	Montana	CERT0026
Alaska	IN00035	Nebraska	E87775
Arizona	AZ0432	Nevada	IN00035
Arkansas	IN00035	New Hampshire*	2124
California	2920	New Mexico	IN00035
Colorado	IN035	New Jersey*	IN598
Colorado Radiochemistry	IN035	New York*	11398
Connecticut	PH-0132	North Carolina	18700
Delaware	IN035	North Dakota	R-035
Florida*	E87775	Ohio	87775
Georgia	929	Oklahoma	D9508
Hawaii	IN035	Oregon (Primary AB)*	4074-001
Idaho	IN00035/E87775	Pennsylvania*	68-00466
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Illinois Microbiology	200001	Rhode Island	LAO00343
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Maine	IN00035	Vermont	VT-8775
Maryland	209	Virginia*	460275
Massachusetts	M-IN035	Washington	C837
Michigan	9926	West Virginia	9927 C
Minnesota*	018-999-338	Wisconsin	999766900
Mississippi	IN035	Wyoming	IN035
Missouri	880		

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Revision date: 04/14/2016

110 South Hill Street
South Bend, IN 46617
Tel: (574) 233-4777
Fax: (574) 233-8207
1 800 332 4345

Laboratory Report

Client: Horsley & Witten

Attn: Gary Hedman
90 Route 6A
Sandwich, MA 02563

Report: 369981
Priority: Standard Written
Status: Final
PWS ID: Not Supplied

Sample Information

EEA ID #	Client ID	Method	Collected Date / Time	Collected By:	Received Date / Time
3519308	HW-5	537	08/10/16 14:18	Client	08/12/16 08:45
3519309	HW-3	537	08/10/16 14:55	Client	08/12/16 08:45

Report Summary

Detailed quantitative results are presented on the following pages. The results presented relate only to the samples provided for analysis.

We appreciate the opportunity to provide you with this analysis. If you have any questions concerning this report, please do not hesitate to call Nathan Trowbridge at (574) 233-4777.

Note: This report may not be reproduced, except in full, without written approval from EEA.

C.S. Manager

Authorized Signature | Title | 08/29/2016 Date

Client Name: Horsley & Witten
Report #: 369981

Client Name: Horsley & Witten Report #: 369981

Sampling Point: HW-5 PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	08/19/16 08:11	08/20/16 04:41	3519308
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	**2.9**	ng/L	08/19/16 08:11	08/20/16 04:41	3519308
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	**8.4**	ng/L	08/19/16 08:11	08/20/16 04:41	3519308
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	**2.5**	ng/L	08/19/16 08:11	08/20/16 04:41	3519308
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	**100**	ng/L	08/19/16 08:11	08/20/16 04:41	3519308
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	**21**	ng/L	08/19/16 08:11	08/20/16 04:41	3519308

Sampling Point: HW-3 PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537	---	9.0	< 9.0	ng/L	08/19/16 08:11	08/20/16 05:12	3519309
375-85-9	Perfluoroheptanoic acid (PFHpA)	537	---	1.0	**74**	ng/L	08/19/16 08:11	08/20/16 05:12	3519309
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537	---	3.0	**9.6**	ng/L	08/19/16 08:11	08/20/16 05:12	3519309
375-95-1	Perfluorononanoic acid (PFNA)	537	---	2.0	**13**	ng/L	08/19/16 08:11	08/20/16 05:12	3519309
1763-23-1	Perfluorooctane sulfonate (PFOS)	537	---	4.0	**120**	ng/L	08/19/16 08:11	08/20/16 05:12	3519309
335-67-1	Perfluorooctanoic acid (PFOA)	537	---	2.0	**40**	ng/L	08/19/16 08:11	08/20/16 05:12	3519309

† EEA has demonstrated it can achieve these report limits in reagent water, but can not document them in all sample matrices.

Reg Limit Type:	MCL	SMCL	AL
Symbol:	*	^	!

Lab Definitions

Continuing Calibration Check Standard (CCC) / Continuing Calibration Verification (CCV) / Initial Calibration Verification Standard (ICV) / Initial Performance Check (IPC) - is a standard containing one or more of the target analytes that is prepared from the same standards used to calibrate the instrument. This standard is used to verify the calibration curve at the beginning of each analytical sequence, and may also be analyzed throughout and at the end of the sequence. The concentration of continuing standards may be varied, when prescribed by the reference method, so that the range of the calibration curve is verified on a regular basis. CCL, CCM, and CCH are the CCC standards at low, mid, and high concentration levels, respectively.

Internal Standards (IS) - are pure compounds with properties similar to the analytes of interest, which are added to field samples or extracts, calibration standards, and quality control standards at a known concentration. They are used to measure the relative responses of the analytes of interest and surrogates in the sample, calibration standard or quality control standard.

Laboratory Duplicate (LD) - is a field sample aliquot taken from the same sample container in the laboratory and analyzed separately using identical procedures. Analysis of laboratory duplicates provides a measure of the precision of the laboratory procedures.

Laboratory Fortified Blank (LFB) / Laboratory Control Sample (LCS) - is an aliquot of reagent water to which known concentrations of the analytes of interest are added. The LFB is analyzed exactly the same as the field samples. LFBs are used to determine whether the method is in control. FBL, FBM, and FBH are the LFB samples at low, mid, and high concentration levels, respectively.

Laboratory Method Blank (LMB) / Laboratory Reagent Blank (LRB) - is a sample of reagent water included in the sample batch analyzed in the same way as the associated field samples. The LMB is used to determine if method analytes or other background contamination have been introduced during the preparation or analytical procedure. The LMB is analyzed exactly the same as the field samples.

Laboratory Trip Blank (LTB) / Field Reagent Blank (FRB) - is a sample of laboratory reagent water placed in a sample container in the laboratory and treated as a field sample, including storage, preservation, and all analytical procedures. The FRB/LTB container follows the collection bottles to and from the collection site, but the FRB/LTB is not opened at any time during the trip. The FRB/LTB is primarily a travel blank used to verify that the samples were not contaminated during shipment.

Matrix Spike Duplicate Sample (MSD) / Laboratory Fortified Sample Matrix Duplicate (LFSMD) - is a sample al6iquot taken from the same field sample source as the Matrix Spike Sample to which known quantities of the analytes of interest are added in the laboratory. The MSD is analyzed exactly the same as the field samples. Analysis of the MSD provides a measure of the precision of the laboratory procedures in a specific matrix. SDL, SDM, and SDH / LFSMDL, LFSMDM, and LFSMDH are the MSD or LFSMD at low, mid, and high concentration levels, respectively.

Matrix Spike Sample (MS) / Laboratory Fortified Sample Matrix (LFSM) - is a sample aliquot taken from field sample source to which known quantities of the analytes of interest are added in the laboratory. The MS is analyzed exactly the same as the field samples. The purpose is to demonstrate recovery of the analytes from a sample matrix to determine if the specific matrix contributes bias to the analytical results. MSL, MSM, and MSH / LFSML, LFSMM, and LFSMH are the MS or LFSM at low, mid, and high concentration levels, respectively.

Quality Control Standard (QCS) / Second Source Calibration Verification (SSCV) - is a solution containing known concentrations of the analytes of interest prepared from a source different from the source of the calibration standards. The solution is obtained from a second manufacturer or lot if the lot can be demonstrated by the manufacturer as prepared independently from other lots. The QCS sample is analyzed using the same procedures as field samples. The QCS is used as a check on the calibration standards used in the method on a routine basis.

Reporting Limit Check (RLC) / Initial Calibration Check Standard (ICCS) - is a procedural standard that is analyzed each day to evaluate instrument performance at or below the minimum reporting limit (MRL).

Surrogate Standard (SS) / Surrogate Analyte (SUR) - is a pure compound with properties similar to the analytes of interest, which is highly unlikely to be found in any field sample, that is added to the field samples, calibration standards, blanks and quality control standards before sample preparation. The SS is used to evaluate the efficiency of the sample preparation process.

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110 S. Hill Street
South Bend, IN 46617
T: 1.800.332.4345
F: 1.574.233.8207

Order # 302890
Batch # 369981

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CHAIN OF CUSTODY RECORD

Page 1 of 1

Shaded area for EEA use only

REPORT TO:	SAMPLER (Signature)	PWS ID #	STATE (sample origin)	PROJECT NAME	PO#
GARY HEDMAN ghedman@horsleywitten.com	JESSE BEAN	NA	MA	BARNSTABLE AIRPORT PFCs	14105
BILL TO: TRACEY ORCIUCH torciuch@horsleywitten.com	COMPLIANCE MONITORING: Yes ☐ No ☒	POPULATION SERVED: NA	SOURCE WATER: GW		

LAB Number	COLLECTION DATE	COLLECTION TIME	AM	PM	SAMPLING SITE	TEST NAME	SAMPLE REMARKS	CHLORINATED YES	CHLORINATED NO	# OF CONTAINERS	MATRIX CODE	TURNAROUND TIME
1 35119.308	8/10/16	1416		X	HW-5	PFC 6/537	21-A SS		X	2	GW	SW
2 309	8/10/16	1455		X	HW-3	PFC 6/537	↓		X	2	GW	SW
3 ↓ 310	8/10/16	1700		X	FMP BLANK	PFC 6/537			X	1		
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												

1418 per 304460 SS 8-12-16

RELINQUISHED BY:(Signature)	DATE	TIME	RECEIVED BY:(Signature)	DATE	TIME
	8/11/16	0750 AM PM			AM PM
RELINQUISHED BY:(Signature)	DATE	TIME	RECEIVED BY:(Signature)	DATE	TIME
		AM PM			AM PM
RELINQUISHED BY:(Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY:	DATE	TIME
		AM PM		8-12-16	0845 AM PM

LAB RESERVES THE RIGHT TO RETURN UNUSED PORTIONS OF NON-AQUEOUS SAMPLES TO CLIENT

LAB COMMENTS
Report results to ghedman@horsleywitten.com

CONDITIONS UPON RECEIPT (check one): X Iced: Wet/Blue ____ Ambient 3.8 °C Upon Receipt____ N/A

MATRIX CODES:
DW-DRINKING WATER
RW-REAGENT WATER
GW-GROUND WATER
EW-EXPOSURE WATER
SW-SURFACE WATER
PW-POOL WATER
WW-WASTE WATER

TURN-AROUND TIME (TAT) - SURCHARGES

SW = Standard Written: (15 working days)	0%	IV* = Immediate Verbal: (3 working days)	100%
RV* = Rush Verbal: (5 working days)	50%	IW* = Immediate Written: (3 working days)	125%
RW* = Rush Written: (5 working days)	75%	SP* = Weekend, Holiday	CALL
		STAT* = Less than 48 hours	CALL

* Please call, expedited service not available for all testing

Samples received unannounced with less than 48 hours holding time remaining may be subject to additional charges.

06-LO-F0435 Issue 5.0 Effective Date: 2016-01-20

Sample analysis will be provided according to the standard EEA/Water Services Terms, which are available upon request. Any other terms proposed by Customer are deemed material alterations and are rejected unless expressly agree to in writing by EEA.

Eurofins Eaton Analytical
Run Log

Run ID: **219547** Method: **537**

Type	Sample Id	Sample Site	Matrix	Instrument ID	Analysis Date	Calibration File
CCL	3527086		OS	DQ	08/20/2016 15:05	082016M537a-DQ.mdb
LRB	3527075		RW	DQ	08/20/2016 16:06	082016M537a-DQ.mdb
FBL	3527076		RW	DQ	08/20/2016 16:37	082016M537a-DQ.mdb
CCM	3527088		OS	DQ	08/20/2016 22:45	082016M537a-DQ.mdb
FTB	3519310	FTB	RW	DQ	08/21/2016 06:26	082016M537a-DQ.mdb
CCH	3527089		OS	DQ	08/21/2016 07:27	082016M537a-DQ.mdb

QC Summary Report

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
CCL	IS-PFOA-13C2	537	N/A	---		128809.00	128809	ng/L	100	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 15:05	3527086
CCL	IS-PFOS-13C4	537	N/A	---		49347.80	49347.8	ng/L	100	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 15:05	3527086
CCL	SS-PFDA-13C2	537	N/A	---		100.0150	100	ng/L	100	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 15:05	3527086
CCL	SS-PFHxA-13C2	537	N/A	---		50.3636	50.0	ng/L	101	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 15:05	3527086
CCL	Perfluorobutanesulfonic acid (PFBS)	537	9.0	---		8.4415	9.0	ng/L	94	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 15:05	3527086
CCL	Perfluoroheptanoic acid (PFHpA)	537	1.0	---		0.9223	1.0	ng/L	92	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 15:05	3527086
CCL	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	---		2.3680	3.0	ng/L	79	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 15:05	3527086
CCL	Perfluorononanoic acid (PFNA)	537	2.0	---		1.7865	2.0	ng/L	89	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 15:05	3527086
CCL	Perfluorooctane sulfonate (PFOS)	537	4.0	---		3.6367	4.0	ng/L	91	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 15:05	3527086
CCL	Perfluorooctanoic acid (PFOA)	537	2.0	---		1.8802	2.0	ng/L	94	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 15:05	3527086
LRB	IS-PFOA-13C2	537	N/A	---		129936.00	128809	ng/L	101	50 - 150	---	---	0.95	08/19/2016 07:53	08/20/2016 16:06	3527075
LRB	IS-PFOS-13C4	537	N/A	---		50218.20	49347.8	ng/L	102	50 - 150	---	---	0.95	08/19/2016 07:53	08/20/2016 16:06	3527075
LRB	SS-PFDA-13C2	537	N/A	---		90.5701	100	ng/L	95	70 - 130	---	---	0.95	08/19/2016 07:53	08/20/2016 16:06	3527075
LRB	SS-PFHxA-13C2	537	N/A	---		45.8285	50.0	ng/L	96	70 - 130	---	---	0.95	08/19/2016 07:53	08/20/2016 16:06	3527075
LRB	Perfluorobutanesulfonic acid (PFBS)	537	9.0	---	<	9.0		ng/L	---	---	---	---	0.95	08/19/2016 07:53	08/20/2016 16:06	3527075
LRB	Perfluoroheptanoic acid (PFHpA)	537	1.0	---	<	1.0		ng/L	---	---	---	---	0.95	08/19/2016 07:53	08/20/2016 16:06	3527075
LRB	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	---	<	3.0		ng/L	---	---	---	---	0.95	08/19/2016 07:53	08/20/2016 16:06	3527075
LRB	Perfluorononanoic acid (PFNA)	537	2.0	---	<	2.0		ng/L	---	---	---	---	0.95	08/19/2016 07:53	08/20/2016 16:06	3527075
LRB	Perfluorooctane sulfonate (PFOS)	537	4.0	---	<	4.0		ng/L	---	---	---	---	0.95	08/19/2016 07:53	08/20/2016 16:06	3527075
LRB	Perfluorooctanoic acid (PFOA)	537	2.0	---	<	2.0		ng/L	---	---	---	---	0.95	08/19/2016 07:53	08/20/2016 16:06	3527075
FBL	IS-PFOA-13C2	537	N/A	---		125111.00	128809	ng/L	97	50 - 150	---	---	1.0	08/19/2016 07:53	08/20/2016 16:37	3527076
FBL	IS-PFOS-13C4	537	N/A	---		48521.10	49347.8	ng/L	98	50 - 150	---	---	1.0	08/19/2016 07:53	08/20/2016 16:37	3527076
FBL	SS-PFDA-13C2	537	N/A	---		92.9757	100	ng/L	93	70 - 130	---	---	1.0	08/19/2016 07:53	08/20/2016 16:37	3527076
FBL	SS-PFHxA-13C2	537	N/A	---		46.3165	50.0	ng/L	93	70 - 130	---	---	1.0	08/19/2016 07:53	08/20/2016 16:37	3527076
FBL	Perfluorobutanesulfonic acid (PFBS)	537	9.0	---		7.7391	9.0	ng/L	86	50 - 150	---	---	1.0	08/19/2016 07:53	08/20/2016 16:37	3527076
FBL	Perfluoroheptanoic acid (PFHpA)	537	1.0	---		0.8817	1.0	ng/L	88	50 - 150	---	---	1.0	08/19/2016 07:53	08/20/2016 16:37	3527076
FBL	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	---		2.2706	3.0	ng/L	76	50 - 150	---	---	1.0	08/19/2016 07:53	08/20/2016 16:37	3527076
FBL	Perfluorononanoic acid (PFNA)	537	2.0	---		1.7896	2.0	ng/L	89	50 - 150	---	---	1.0	08/19/2016 07:53	08/20/2016 16:37	3527076
FBL	Perfluorooctane sulfonate (PFOS)	537	4.0	---		3.4208	4.0	ng/L	86	50 - 150	---	---	1.0	08/19/2016 07:53	08/20/2016 16:37	3527076
FBL	Perfluorooctanoic acid (PFOA)	537	2.0	---		1.9523	2.0	ng/L	98	50 - 150	---	---	1.0	08/19/2016 07:53	08/20/2016 16:37	3527076
CCM	IS-PFOA-13C2	537	N/A	---		133734.00	133734	ng/L	100	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 22:45	3527088
CCM	IS-PFOS-13C4	537	N/A	---		60972.00	60972	ng/L	100	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 22:45	3527088
CCM	SS-PFDA-13C2	537	N/A	---		98.0025	100	ng/L	98	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 22:45	3527088
CCM	SS-PFHxA-13C2	537	N/A	---		49.5958	50.0	ng/L	99	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 22:45	3527088
CCM	Perfluorobutanesulfonic acid (PFBS)	537	9.0	---		686.1980	675	ng/L	102	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 22:45	3527088
CCM	Perfluoroheptanoic acid (PFHpA)	537	1.0	---		75.7993	75.0	ng/L	101	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 22:45	3527088
CCM	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	---		220.2640	225	ng/L	98	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 22:45	3527088
CCM	Perfluorononanoic acid (PFNA)	537	2.0	---		154.3730	150	ng/L	103	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 22:45	3527088
CCM	Perfluorooctane sulfonate (PFOS)	537	4.0	---		285.4030	300	ng/L	95	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 22:45	3527088
CCM	Perfluorooctanoic acid (PFOA)	537	2.0	---		153.5450	150	ng/L	102	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 22:45	3527088

QC Summary Report (cont.)																
Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
FTB	IS-PFOA-13C2	537	N/A	FTB		120892.00	133734	ng/L	90	50 - 150	---	---	0.88	08/19/2016 07:53	08/21/2016 06:26	3519310
FTB	IS-PFOS-13C4	537	N/A	FTB		48913.70	60972	ng/L	80	50 - 150	---	---	0.88	08/19/2016 07:53	08/21/2016 06:26	3519310
FTB	SS-PFDA-13C2	537	N/A	FTB		81.9431	100	ng/L	93	70 - 130	---	---	0.88	08/19/2016 07:53	08/21/2016 06:26	3519310
FTB	SS-PFHxA-13C2	537	N/A	FTB		41.7456	50.0	ng/L	95	70 - 130	---	---	0.88	08/19/2016 07:53	08/21/2016 06:26	3519310
FTB	Perfluorobutanesulfonic acid (PFBS)	537	9.0	FTB	<	9.0		ng/L	---	---	---	---	0.88	08/19/2016 07:53	08/21/2016 06:26	3519310
FTB	Perfluoroheptanoic acid (PFHpA)	537	1.0	FTB	<	1.0		ng/L	---	---	---	---	0.88	08/19/2016 07:53	08/21/2016 06:26	3519310
FTB	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	FTB	<	3.0		ng/L	---	---	---	---	0.88	08/19/2016 07:53	08/21/2016 06:26	3519310
FTB	Perfluorononanoic acid (PFNA)	537	2.0	FTB	<	2.0		ng/L	---	---	---	---	0.88	08/19/2016 07:53	08/21/2016 06:26	3519310
FTB	Perfluorooctane sulfonate (PFOS)	537	4.0	FTB	<	4.0		ng/L	---	---	---	---	0.88	08/19/2016 07:53	08/21/2016 06:26	3519310
FTB	Perfluorooctanoic acid (PFOA)	537	2.0	FTB	<	2.0		ng/L	---	---	---	---	0.88	08/19/2016 07:53	08/21/2016 06:26	3519310
CCH	IS-PFOA-13C2	537	N/A	---		127269.00	127269	ng/L	100	50 - 150	---	---	1.0	08/18/2016 14:13	08/21/2016 07:27	3527089
CCH	IS-PFOS-13C4	537	N/A	---		58693.20	58693.2	ng/L	100	50 - 150	---	---	1.0	08/18/2016 14:13	08/21/2016 07:27	3527089
CCH	SS-PFDA-13C2	537	N/A	---		101.1730	100	ng/L	101	70 - 130	---	---	1.0	08/18/2016 14:13	08/21/2016 07:27	3527089
CCH	SS-PFHxA-13C2	537	N/A	---		50.4059	50.0	ng/L	101	70 - 130	---	---	1.0	08/18/2016 14:13	08/21/2016 07:27	3527089
CCH	Perfluorobutanesulfonic acid (PFBS)	537	9.0	---		1115.9300	1125	ng/L	99	70 - 130	---	---	1.0	08/18/2016 14:13	08/21/2016 07:27	3527089
CCH	Perfluoroheptanoic acid (PFHpA)	537	1.0	---		126.1740	125	ng/L	101	70 - 130	---	---	1.0	08/18/2016 14:13	08/21/2016 07:27	3527089
CCH	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	---		384.8700	375	ng/L	103	70 - 130	---	---	1.0	08/18/2016 14:13	08/21/2016 07:27	3527089
CCH	Perfluorononanoic acid (PFNA)	537	2.0	---		254.7090	250	ng/L	102	70 - 130	---	---	1.0	08/18/2016 14:13	08/21/2016 07:27	3527089
CCH	Perfluorooctane sulfonate (PFOS)	537	4.0	---		519.2820	500	ng/L	104	70 - 130	---	---	1.0	08/18/2016 14:13	08/21/2016 07:27	3527089
CCH	Perfluorooctanoic acid (PFOA)	537	2.0	---		254.1510	250	ng/L	102	70 - 130	---	---	1.0	08/18/2016 14:13	08/21/2016 07:27	3527089

Eurofins Eaton Analytical
Run Log

Run ID: **219570** Method: **537**

Type	Sample Id	Sample Site	Matrix	Instrument ID	Analysis Date	Calibration File
CCL	3526725		OS	CY	08/20/2016 00:04	081916M537a-CY.mdb
LRB	3526914		RW	CY	08/20/2016 01:06	081916M537a-CY.mdb
FBL	3526915		RW	CY	08/20/2016 01:37	081916M537a-CY.mdb
FBM	3526916		RW	CY	08/20/2016 02:07	081916M537a-CY.mdb
FS	3519308	HW-5	GW	CY	08/20/2016 04:41	081916M537a-CY.mdb
FS	3519309	HW-3	GW	CY	08/20/2016 05:12	081916M537a-CY.mdb
CCM	3526726		OS	CY	08/20/2016 11:21	081916M537a-CY.mdb

QC Summary Report

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
CCL	IS-PFOA-13C2	537	N/A	---		1917.78	1917.78	ng/L	100	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 00:04	3526725
CCL	IS-PFOS-13C4	537	N/A	---		1303.73	1303.73	ng/L	100	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 00:04	3526725
CCL	SS-PFDA-13C2	537	N/A	---		96.8306	100	ng/L	97	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 00:04	3526725
CCL	SS-PFHxA-13C2	537	N/A	---		50.4545	50.0	ng/L	101	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 00:04	3526725
CCL	Perfluorobutanesulfonic acid (PFBS)	537	9.0	---		8.7745	9.0	ng/L	97	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 00:04	3526725
CCL	Perfluoroheptanoic acid (PFHpA)	537	1.0	---		0.9001	1.0	ng/L	90	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 00:04	3526725
CCL	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	---		2.3684	3.0	ng/L	79	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 00:04	3526725
CCL	Perfluorononanoic acid (PFNA)	537	2.0	---		1.9315	2.0	ng/L	97	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 00:04	3526725
CCL	Perfluorooctane sulfonate (PFOS)	537	4.0	---		3.7152	4.0	ng/L	93	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 00:04	3526725
CCL	Perfluorooctanoic acid (PFOA)	537	2.0	---		1.7456	2.0	ng/L	87	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 00:04	3526725
LRB	IS-PFOA-13C2	537	N/A	---		1888.78	1917.78	ng/L	98	50 - 150	---	---	0.94	08/19/2016 08:11	08/20/2016 01:06	3526914
LRB	IS-PFOS-13C4	537	N/A	---		1217.92	1303.73	ng/L	93	50 - 150	---	---	0.94	08/19/2016 08:11	08/20/2016 01:06	3526914
LRB	SS-PFDA-13C2	537	N/A	---		91.7305	100	ng/L	98	70 - 130	---	---	0.94	08/19/2016 08:11	08/20/2016 01:06	3526914
LRB	SS-PFHxA-13C2	537	N/A	---		45.6541	50.0	ng/L	97	70 - 130	---	---	0.94	08/19/2016 08:11	08/20/2016 01:06	3526914
LRB	Perfluorobutanesulfonic acid (PFBS)	537	9.0	---	<	9.0		ng/L	---	---	---	---	0.94	08/19/2016 08:11	08/20/2016 01:06	3526914
LRB	Perfluoroheptanoic acid (PFHpA)	537	1.0	---	<	1.0		ng/L	---	---	---	---	0.94	08/19/2016 08:11	08/20/2016 01:06	3526914
LRB	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	---	<	3.0		ng/L	---	---	---	---	0.94	08/19/2016 08:11	08/20/2016 01:06	3526914
LRB	Perfluorononanoic acid (PFNA)	537	2.0	---	<	2.0		ng/L	---	---	---	---	0.94	08/19/2016 08:11	08/20/2016 01:06	3526914
LRB	Perfluorooctane sulfonate (PFOS)	537	4.0	---	<	4.0		ng/L	---	---	---	---	0.94	08/19/2016 08:11	08/20/2016 01:06	3526914
LRB	Perfluorooctanoic acid (PFOA)	537	2.0	---	<	2.0		ng/L	---	---	---	---	0.94	08/19/2016 08:11	08/20/2016 01:06	3526914
FBL	IS-PFOA-13C2	537	N/A	---		1979.11	1917.78	ng/L	103	50 - 150	---	---	1.0	08/19/2016 08:11	08/20/2016 01:37	3526915
FBL	IS-PFOS-13C4	537	N/A	---		1264.15	1303.73	ng/L	97	50 - 150	---	---	1.0	08/19/2016 08:11	08/20/2016 01:37	3526915
FBL	SS-PFDA-13C2	537	N/A	---		93.8631	100	ng/L	94	70 - 130	---	---	1.0	08/19/2016 08:11	08/20/2016 01:37	3526915
FBL	SS-PFHxA-13C2	537	N/A	---		46.7402	50.0	ng/L	93	70 - 130	---	---	1.0	08/19/2016 08:11	08/20/2016 01:37	3526915
FBL	Perfluorobutanesulfonic acid (PFBS)	537	9.0	---		9.2513	9.0	ng/L	103	50 - 150	---	---	1.0	08/19/2016 08:11	08/20/2016 01:37	3526915
FBL	Perfluoroheptanoic acid (PFHpA)	537	1.0	---		1.0240	1.0	ng/L	102	50 - 150	---	---	1.0	08/19/2016 08:11	08/20/2016 01:37	3526915
FBL	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	---		2.4629	3.0	ng/L	82	50 - 150	---	---	1.0	08/19/2016 08:11	08/20/2016 01:37	3526915
FBL	Perfluorononanoic acid (PFNA)	537	2.0	---		1.8509	2.0	ng/L	93	50 - 150	---	---	1.0	08/19/2016 08:11	08/20/2016 01:37	3526915
FBL	Perfluorooctane sulfonate (PFOS)	537	4.0	---		3.2635	4.0	ng/L	82	50 - 150	---	---	1.0	08/19/2016 08:11	08/20/2016 01:37	3526915
FBL	Perfluorooctanoic acid (PFOA)	537	2.0	---		1.9230	2.0	ng/L	96	50 - 150	---	---	1.0	08/19/2016 08:11	08/20/2016 01:37	3526915
FBM	IS-PFOA-13C2	537	N/A	---		1865.97	1917.78	ng/L	97	50 - 150	---	---	1.0	08/19/2016 08:11	08/20/2016 02:07	3526916
FBM	IS-PFOS-13C4	537	N/A	---		1185.70	1303.73	ng/L	91	50 - 150	---	---	1.0	08/19/2016 08:11	08/20/2016 02:07	3526916
FBM	SS-PFDA-13C2	537	N/A	---		100.0090	100	ng/L	100	70 - 130	---	---	1.0	08/19/2016 08:11	08/20/2016 02:07	3526916
FBM	SS-PFHxA-13C2	537	N/A	---		50.7487	50.0	ng/L	101	70 - 130	---	---	1.0	08/19/2016 08:11	08/20/2016 02:07	3526916
FBM	Perfluorobutanesulfonic acid (PFBS)	537	9.0	---		681.4550	675	ng/L	101	70 - 130	---	---	1.0	08/19/2016 08:11	08/20/2016 02:07	3526916
FBM	Perfluoroheptanoic acid (PFHpA)	537	1.0	---		71.2835	75.0	ng/L	95	70 - 130	---	---	1.0	08/19/2016 08:11	08/20/2016 02:07	3526916
FBM	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	---		220.0660	225	ng/L	98	70 - 130	---	---	1.0	08/19/2016 08:11	08/20/2016 02:07	3526916
FBM	Perfluorononanoic acid (PFNA)	537	2.0	---		148.3300	150	ng/L	99	70 - 130	---	---	1.0	08/19/2016 08:11	08/20/2016 02:07	3526916
FBM	Perfluorooctane sulfonate (PFOS)	537	4.0	---		297.3950	300	ng/L	99	70 - 130	---	---	1.0	08/19/2016 08:11	08/20/2016 02:07	3526916
FBM	Perfluorooctanoic acid (PFOA)	537	2.0	---		145.8080	150	ng/L	97	70 - 130	---	---	1.0	08/19/2016 08:11	08/20/2016 02:07	3526916

QC Summary Report (cont.)																
Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
FS	IS-PFOA-13C2	537	N/A	HW-5		2028.54	1917.78	ng/L	106	50 - 150	---	---	0.95	08/19/2016 08:11	08/20/2016 04:41	3519308
FS	IS-PFOS-13C4	537	N/A	HW-5		1275.77	1303.73	ng/L	98	50 - 150	---	---	0.95	08/19/2016 08:11	08/20/2016 04:41	3519308
FS	SS-PFDA-13C2	537	N/A	HW-5		101.6170	100	ng/L	107	70 - 130	---	---	0.95	08/19/2016 08:11	08/20/2016 04:41	3519308
FS	SS-PFHxA-13C2	537	N/A	HW-5		41.7464	50.0	ng/L	88	70 - 130	---	---	0.95	08/19/2016 08:11	08/20/2016 04:41	3519308
FS	Perfluorobutanesulfonic acid (PFBS)	537	9.0	HW-5	<	9.0		ng/L	---	---	---	---	0.95	08/19/2016 08:11	08/20/2016 04:41	3519308
FS	Perfluoroheptanoic acid (PFHpA)	537	1.0	HW-5		2.9		ng/L	---	---	---	---	0.95	08/19/2016 08:11	08/20/2016 04:41	3519308
FS	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	HW-5		8.4		ng/L	---	---	---	---	0.95	08/19/2016 08:11	08/20/2016 04:41	3519308
FS	Perfluorononanoic acid (PFNA)	537	2.0	HW-5		2.5		ng/L	---	---	---	---	0.95	08/19/2016 08:11	08/20/2016 04:41	3519308
FS	Perfluorooctane sulfonate (PFOS)	537	4.0	HW-5		100		ng/L	---	---	---	---	0.95	08/19/2016 08:11	08/20/2016 04:41	3519308
FS	Perfluorooctanoic acid (PFOA)	537	2.0	HW-5		21		ng/L	---	---	---	---	0.95	08/19/2016 08:11	08/20/2016 04:41	3519308
FS	IS-PFOA-13C2	537	N/A	HW-3		2001.83	1917.78	ng/L	104	50 - 150	---	---	0.92	08/19/2016 08:11	08/20/2016 05:12	3519309
FS	IS-PFOS-13C4	537	N/A	HW-3		1305.48	1303.73	ng/L	100	50 - 150	---	---	0.92	08/19/2016 08:11	08/20/2016 05:12	3519309
FS	SS-PFDA-13C2	537	N/A	HW-3		85.0795	100	ng/L	92	70 - 130	---	---	0.92	08/19/2016 08:11	08/20/2016 05:12	3519309
FS	SS-PFHxA-13C2	537	N/A	HW-3		42.1509	50.0	ng/L	92	70 - 130	---	---	0.92	08/19/2016 08:11	08/20/2016 05:12	3519309
FS	Perfluorobutanesulfonic acid (PFBS)	537	9.0	HW-3	<	9.0		ng/L	---	---	---	---	0.92	08/19/2016 08:11	08/20/2016 05:12	3519309
FS	Perfluoroheptanoic acid (PFHpA)	537	1.0	HW-3		74		ng/L	---	---	---	---	0.92	08/19/2016 08:11	08/20/2016 05:12	3519309
FS	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	HW-3		9.6		ng/L	---	---	---	---	0.92	08/19/2016 08:11	08/20/2016 05:12	3519309
FS	Perfluorononanoic acid (PFNA)	537	2.0	HW-3		13		ng/L	---	---	---	---	0.92	08/19/2016 08:11	08/20/2016 05:12	3519309
FS	Perfluorooctane sulfonate (PFOS)	537	4.0	HW-3		120		ng/L	---	---	---	---	0.92	08/19/2016 08:11	08/20/2016 05:12	3519309
FS	Perfluorooctanoic acid (PFOA)	537	2.0	HW-3		40		ng/L	---	---	---	---	0.92	08/19/2016 08:11	08/20/2016 05:12	3519309
CCM	IS-PFOA-13C2	537	N/A	---		2065.90	2065.9	ng/L	100	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 11:21	3526726
CCM	IS-PFOS-13C4	537	N/A	---		1318.49	1318.49	ng/L	100	50 - 150	---	---	1.0	08/18/2016 14:13	08/20/2016 11:21	3526726
CCM	SS-PFDA-13C2	537	N/A	---		94.7429	100	ng/L	95	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 11:21	3526726
CCM	SS-PFHxA-13C2	537	N/A	---		48.4762	50.0	ng/L	97	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 11:21	3526726
CCM	Perfluorobutanesulfonic acid (PFBS)	537	9.0	---		670.2620	675	ng/L	99	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 11:21	3526726
CCM	Perfluoroheptanoic acid (PFHpA)	537	1.0	---		75.8574	75.0	ng/L	101	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 11:21	3526726
CCM	Perfluorohexanesulfonic acid (PFHxS)	537	3.0	---		228.7540	225	ng/L	102	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 11:21	3526726
CCM	Perfluorononanoic acid (PFNA)	537	2.0	---		153.9910	150	ng/L	103	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 11:21	3526726
CCM	Perfluorooctane sulfonate (PFOS)	537	4.0	---		300.4270	300	ng/L	100	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 11:21	3526726
CCM	Perfluorooctanoic acid (PFOA)	537	2.0	---		150.9660	150	ng/L	101	70 - 130	---	---	1.0	08/18/2016 14:13	08/20/2016 11:21	3526726

Sample Type Key

Type (Abbr.)	Sample Type	Type (Abbr.)	Sample Type
CCH	Continuing Calibration High		
CCL	Continuing Calibration Low		
CCM	Continuing Calibration Mid		
FS	Field Sample		
FTB	Field Trip Blank		
FBL	Fortified Blank Low		
FBM	Fortified Blank Mid		
LRB	Laboratory Reagent Blank		

END OF REPORT

IEP Inc. BORING LOG

BORING NO. OW-C1

SHEET 1 **OF** 2

PROJECT Barnstable Water Company	**PROJECT**
LOCATION Rte 28 + Yarmouth Road	**ELEVATION AND DATUM** 24.55(S) 24.76(M) 24.82(B) 24.86(RR) M
BORING CONTRACTOR Desmond Well Drilling	**DATE** 21 July 87 / **COMPLETION DEPTH** 95'
BORING EQUIPMENT Hollow Stem Auger	**OBSERVED WATER LEVEL DATA** ~18'

ELEV.	DESCRIPTION	DEPTH SCALE	WELL DETAILS	SAMPLE NO.	REMARKS
	0-10' VF/M+ SAND and F/M+ gravel	5'			OW-C1R installed 18 Aug 87 — cemented water boxes w/ clamp seals; 2" diameter PVC risers
	brown M/C+ SAND, trace F gravel	10'		SS-1	3-4-6, R=12"
	~12-14' layer of M/C+ gravel; 14' back into dk br M/C+ Sand	15'			gravel up to 4" diameter
	F/C+ SAND, trace F gravel	20'		SS-2	8-5-7, R=16"
		25'			10', 0.010 slot, Sch. 40, flush joint threaded PVC screen w/ point
	brown M/C+ SAND, some F gravel	30'		SS-3	4-8-8
		35'			
	brown F/C+ SAND, some F/M gravel	40'		SS-4	6-5-4 HNU (head-space in sample jar) 2ppm
	F/C+ SAND; some F gravel	45'		SS-5	4-7-13, R=1/2" (first attempt, 16-56, empty)
	NO recovery	50'		SS-6	4-6-11 R=0"; no change in auger flights
	brown F/C+ SAND; some F gravel	55'		SS-7	17-15-15, R=18"; HNU 0 ppm; reddish brown Fe staining,
	brown M/C+ SAND; some F gravel	60'		SS-8	2-6-9
	red brown M/C+ SAND; some F gravel	65'		SS-9	15-11-8

INSPECTOR: M. Nelson

IEP Inc. BORING LOG

BORING NO. OW-9

SHEET 2 OF 2

PROJECT: Barnstable Water Company

LOCATION: Rte 28 + Yarmouth Road

BORING CONTRACTOR: Desmond Well Drilling

BORING EQUIPMENT: Hollow Stem Auger

PROJECT:

ELEVATION AND DATUM: MSL
24.55(s) 24.76(m), 24.82(d), 24.88(d2)

DATE: 21 JULY 87

COMPLETION DEPTH: 95'

OBSERVED WATER LEVEL DATA: ~18'

LEV.	DESCRIPTION	DEPTH SCALE	WELL DETAILS	SAMPLE NO.	REMARKS
		70'			
	F/C + SAND, some f gravel	75'		SS-10	21-12-12, R=18", HNU=0 ppm
		80'			
	same, brown	85'		SS-11	15-15-19 HNU=0 ppm
	pockets of brown and grey CLAY on last flight of auger	90'			10', 0.010 slot, schedule 40, flush joint threaded, PVC screens with point
	BOH 95'	95'			
		100'			
		105'			
		110'			

INSPECTOR: M. Nelson

BORING LOG

Boring No. OW-18
Sheet 1 of 2

Project: Water Quality Investigation
Client: Maher Wellfield Task Force
Boring Contractor: Desmond Well Drilling, Inc.
Boring Equipment: hollow stem auger
Ground Water: Date Depth, ft.

Date: 30 July 1990
Completion Depth: 125.5'
Elevation: 39.27 (s), 39.12 (m), 39.06 (d) msl
Inspector: M. Nelson, R. Lamb

Depth (feet)	Description	Sample Number	Penetra./ Recovery	Blow Count	Comments	Well Details
0	f/c SAND, m gravel				cemented water boxes with clay seals	
5						
10						
15					2" diameter, schedule 40, flush joint threaded, PVC risers	
20						
25	f/m+c SAND, some f/m gravel	ss-1		6-14-14	10', 0.010 slot, schedule 40, flush joint threaded, PVC	
30	f/c SAND, trace gravel	ss-2	18"/6"	3-5-9	screen with point set at 34'	
35	f/m+c SAND	ss-3	18"/6"	3-4-8		
40	f/m+c SAND, trace f gravel	ss-4		9-14-25	dark color	
45	f/m+c SAND, some m gravel	ss-5	18"/12"	5-13-30		
50	f/c SAND	ss-6	18"/14"	6-13-28		
55	f/c SAND, trace f gravel	ss-7	18"/2"	5-4-8		
60	f/c+ SAND, trace f gravel	ss-8				
65	f+/m SAND	ss-9			10' heave	
70	f/m SAND; 2" c SAND and f/mgravel	ss-10			Fe stain	
75	f/c+ SAND	ss-11		10-20-9	10', 0.010 slot PVC screen (see above) set at 75'	
80	f/m+/c SAND, trace m gravel	ss-18	24"/24"		2.5' heave	

Proportions used:

trace (tr)	0-10%
little (li)	10-20%
some (so)	20-35%
and	35-50%

Abbreviations:

f = fine	f/c = fine to coarse
m = medium	v = very
c = coarse	+ = more
f/m = fine to medium	- = less

HWH, Inc.

BORING LOG

Boring No. OW-18
Sheet 2 of 2

Project: Water Quality Investigation
Client: Maher Wellfield Task Force
Boring Contractor: Desmond Well Drilling, Inc.
Boring Equipment: hollow stem auger
Ground Water: Date Depth, ft.

Date: 30 July 1990
Completion Depth: 125.5'
Elevation: 39.27 (s), 39.12 (m), 39.06 (d) msl
Inspector: M. Nelson, R. Lamb

Depth (feet)	Description	Sample Number	Penetra./ Recovery	Blow Count	Comments	Well Details
85	f/m+/c SAND, some f gravel	ss-13		7-4-8	small sample	
90	f/c+ SAND, some f/m gravel	ss-14	18"/18"	6-8-10		
95	f/c SAND	ss-15	18"/12"	4-7-8		
100	same	ss-16		3-7-17		
105	f/m+/c SAND	ss-17				
110	greyish f+/m SAND	ss-18	24"/24"		2.5' heave	
115	f/c SAND, trace blue silty sand	ss-19			1.5' heave	
120	f SAND, trace blue-grey silty sand	ss-20			10', 0.010 slot, schedule 40, flush threaded PVC screen with point set at 125.5'	
125	grey f/m SAND, m gravel, f silty sand, trace clay	ss-21				
130	BOH 125.5'					

Proportions used:

trace (tr)	0-10%
little (li)	10-20%
some (so)	20-35%
and	35-50%

Abbreviations:

f = fine	f/c = fine to coarse
m = medium	v = very
c = coarse	+ = more
f/m = fine to medium	- = less

HWH, Inc.

BORING LOG

Boring No. HW-5
Sheet 1 of 1

Project: Barnstable Airport
Client: Ben Jones, Manager
Boring Contractor: Desmond Well Drilling, Inc.
Boring Equipment: Hollow Stem Auger
Ground Water: Date 6/24/96 Depth, ft. 25' below land surface

Date: 24 June 1996
Completion Depth: 28 feet bls
Elevation: N/A
Inspector: H. Frank

Depth Feet	Description	Sample Number	Penetra./ Recovery	Blow Count	USCS Code	USCS Color	USCS Angularity	Comments	Well Details	Depth Feet
0								Locking road box		0
								Cement seal		
2								Bentonite seal		2
	F-C poorly graded sand w/	HW-5.1	15"/24"	34-28-32-30	SP	Br	rnd-subrnd			
4	>15% gravel, dry, no odor, no									4
	cement, 2" Br layer of silt									
6	PID: 0.0									6
8	F-M-C well graded sand w/	HW-5.2	11.5"/24"	18-18-24-27	SW	Br-	rnd-subrnd			8
	<15% gravel, dry, no cement					lt. Br-		Native backfill		
10	no odor, PID: 0.0					Beige				10
12										12
	F-VC poorly graded sand w/	HW-5.3	15"/24"	14-36-27-47	SP	Br-	rnd-subrnd			
14	>15% gravel, dry, no odor,					lt. Br-		23 ft. of sch. 40, threaded PVC riser		14
	no cement, PID: 0.0					Beige				
16										16
18	F-VC poorly graded sand w/	HW-5.4	14"/24"	12-20-24-24	SP	Br -	rnd-subrnd			18
	>15% gravel, dry, no odor, so					lt. Br-		Bentonite Seal		
20	rock frags, Fe stain layer					Beige				20
	no cement, PID: 0.0							Native Backfill		
22										22
	F-M-C well graded sand w/	HW-5.5	15"/24"	6-8-10-14	SW	lt. Br	rnd-subrnd	5 ft. of .010 slot, threaded PVC		
24	<15% gravel, dry, no odor					Beige		screen		24
	, no cement, PID: 3.1							WATER TABLE		
26										26
28	F-M-C well graded sand	HW-5.6	17"/24"	1-1-1-1	SW	Gy	rnd-subrnd	BOTTOM OF HOLE		28
	w/ <15% gravel, wet, no									
30	cement, strong petroleum									30
	odor, PID: 333 ppm									
32										32
34										34
36										36

Proportions Used:

trace (tr)	0 - 10%
little (li)	10 - 20%
some (so)	20 - 35%

Abbreviations:

Color

Blue (Bl)	Green (Gr)
Red (R)	Gray (Gy)
Light (lt)	Brown (Br)
Dark (dk)	Orange (Or)
Rust (Ru)	Black (Blk)

Angular

Round (rnd.)
Angular (ang.)

Misc.

Fragments (frag.)
Cement (Cem.)
Well-Graded (W-G)
Poorly-Graded (P-G)
Not Available (N/A)

Size

Fine = (F)	Fine to Coarse = F-C
Medium = (M)	Very = (V)
Coarse = (C)	More/Less = (+/-)
Dark = (dk)	

H&W, Inc.